GIVING THE RIGHT SIGNALS; KEEPING COMPETENCE ON TRACK
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SUMMARY
This paper explores competence management and those environmental factors (Political, Environment, Sociological, Technological, Legal and Economic) that will have an effect on it, such as the ‘delta’ between the future demand and supply of engineering talent. Identifying a robust definition for competence management and what competence it gives a platform from which to identify threats and opportunities facing those people managing competence with regard for its future in the rail industry. This paper sets out to take competence management as a business function in its own right and embrace a wider tactical and strategic approach in conjunction with that of ‘total capability and capacity’ and operate in a more holistic way. An in depth understanding of the context of the specific business will enable those managing competence to maintain relevant, reliable and robust competence management processes and systems. It will facilitate identification strategies for increasing the capacity of engineers across a range of disciplines necessary to provide the right performance that brings business results in continuously challenging circumstances.

1 INTRODUCTION
Competence management is a ‘hot potato’ with HR professionals and business in general. This is driven by a recognition of the importance of ensuring that a business remains commercially viable through the merit of its intellectual capital.

What is competence? How do we capture our requirements? What do we need to know about our organisation and its environment in order for competence management to succeed in ensuring performance meets or exceeds the expectations of stakeholders and customers? How does this information translate into competence requirements? Are Competence Management Systems really the panacea they profess to be? These are just some of the questions that should be being asked of those who practise competence management in any industry.

A brief ‘Google’ search of what competence is returns many results and the Chartered Institute of Personnel and Development (CIPD) identify competence as “the behaviours (and, where appropriate, technical attributes) that individuals must have, or must acquire, to perform effectively at work – that is, the terms focus on the personal attributes or inputs of the individual.” (Egan, 2012). Essentially identifying the knowledge skills and behavioural attributes required to carry out a task to a given standard, under certain conditions. This description and is sufficient and with ‘scaffolding’ we can begin to support discussion and answer the questions identified previously.

Given the broad and deep changes happening across the rail industry, there is a need for those managing competence to contextualise their discipline within their business environment, improve performance and provide real results. Remaining focused on the basics but having a holistic approach will be critical in ensuring the industry’s biggest asset, its people, continue to realise and better their true potential.

2 BACKGROUND
Current and future United Kingdom transport requirements dictate that its rail industry has to adapt to changes in how employees and employers develop careers. Analysis and understanding of the various business environments, as shown later, will testify to this and highly publicised research, within engineering and academic domains, has been contradictory over whether accepting ‘jobs for life’ with one company may be a thing of the past and now may be more of a ‘life of jobs’ (BBC, 2011) (Personnel Today, 2007). In light of the confusion, companies that service and support the UK rail industry, from permanent way through to telecommunications and signalling, must develop smarter ways of identifying, developing and sustaining competence in safety critical environments. Ultimately this will ensure employees deliver to the business objectives and meet sales targets, whilst developing a rewarding career in engineering and support functions.
An added challenge is the shortage of people in the UK who have chosen a career in a range of engineering disciplines coming into the rail industry. The Sector Skills Council for Science, Engineering and Manufacturing Technologies (SEMTA) report that “30,000 skilled engineers need to be added to the UK workforce per year between now and 2016 to fill the gap of highly skilled workers reaching retirement.” (Wagner, 2010)

In response the UK industry is beginning to increase focus on attracting and developing apprentices and graduates for the future. Alongside this there are proposals to rationalise and improve the process of the development of railway employees across the industry and initiatives abound to work toward a smarter and more competent future. Invensys Rail cannot single handedly close this skills gap but it can think more smartly about how it manages its people to reduce the impact of the gap while partnering with others on the wider issue.

As an example, application engineering disciplines that were once a ‘black art’ are now becoming more integrated and automated so requiring us to up-skill our people accordingly however we must balance this with the retention and development of the underlying skills and knowledge.

There are a number of other factors to be considered if a modern technology business is going to succeed in maintaining and building workforce competence for the future. This paper concentrates on the needs of the UK rail industry, its suppliers and partners but looks to general best practice in the search for excellence in competence management. One of the criticisms of competence management is that the focus is on the past when what should happen is a continuous focus on the future with lessons learned from the past. (Egan, 2012).

What follows is an exploration and discussion of the various factors that should be affecting change in competence management for the future, recommendations for a brighter future and final thoughts on where future opportunities lie.

3 DISCUSSION

3.1.1 Politics

It is an important time, politically, for the UK rail industry. Incidents and accidents, although rare, are highly publicised affairs. All political parties in the UK have the future of rail transport high on their agendas recognising its potential for sustainability and capacity but with the need for that to be realised efficiently and with value for money. (RSSB, 2009).

Supporting this belief, Network Rail acknowledges the current Government and Department for Transport (DfT) are putting the customer first, seeking to increase capacity and providing greater value for money (DfT, 2012). As a result, it’s important to recognise these challenges provide opportunity to suppliers to the rail industry; a brief look at the number of initiatives being considered by the DfT across the rail industry is enough to give any company supplying the rail industry renewed enthusiasm and a view of a potentially bright but competitive future.

While the drive to support development of the national railways is right up there in the manifestos the nature and structure of projects is changing for Invensys Rail, its customers and competitors, moving toward ‘alliances’ and collaborative working, in particular with regard to European Train Control Systems (ETCS) and the recent Network Rail Signalling Framework announcements.

With plans for improvements to rail infrastructure currently running through to 2032/33 (Topham, 2012) the ‘cross-party’ political support will come with changing strategies in planning the execution and funding of their respective policies and those who plan for managing a competent workforce must be cognisant of this. Agility will be a key requirement for the future, as will combining strategic and tactical approaches to cover off long and short term competence needs.

In developing smarter and better engineering practices for the rail industry, and rail signalling in particular, we must be aware of the increasing level of scrutiny the rail industry is likely to come under in the future. Having said that, increased capacity and the introduction of new technology through political agendas will positively enhance our ability to deliver a sustainable and interoperable railway, with enhanced signalling and associated skill sets.

There is a final point to make on the politics of developing the railway. In order to manage our way to a consistently competent workforce, constant attention must continue to be paid by professional awarding bodies and licensing authorities to demands on the industry both through policies and process. Likewise, Invensys Rail, as partners in driving the delivery of technological changes and improvements, must work alongside our
customers and stakeholders, including professional and licensing bodies, to ensure a competent workforce through transparent and credible competence management.

3.1.2 The Environment

Rail is at the forefront of environmental sustainability programmes and ‘green’ agendas. We must recognise the development required to ensure our people constantly assess the environmental impact of their work and ensure we ask ourselves pertinent questions such as: do our current competence management techniques and strategies acknowledge the impact of environmental challenges in the future?

We regularly hear the benefits in terms of the numbers of passengers versus fuel consumed and how rail travel can reduce an individual’s carbon footprint through moving people and freight from road vehicles. We also hear about the environmental impact of upgrading the rail infrastructure and how, with a longer term view, the benefits will outweigh the disadvantages given the increased capacity. As an example, First Group’s Climate Change Report (2007) identified areas for reducing carbon footprints for its rolling stock over time with some that should be being realised right now.

There is a push towards further electrification of our national railway and recognition that ERTMS and ETCS has its part to play in managing and reducing the environmental impact of new infrastructure and train control strategies. In 2009 Invensys Rail suggested that 12% of a 46% reduction in carbon emissions by 2030 would come from reduced power requirements from the railway but, more relevant, is a potential reduction of almost 10% of carbon dioxide emissions coming through developing signalling and train control technology alone.

Managing the competence of those involved in train control will be affected by the impact of environmental challenges in the future and technological advances are necessitating evaluation and analysis of behavioural and technical competence requirements to support the introduction and maintenance of this technology.

Behaviourally, in terms of people’s attitudes to their work, the aforementioned points are essential. This is because studies have shown that future generations, ‘Y’ (Eisner, 2005) and beyond are and will continue to be more aware of their and our influence on our world. There is limited development work outside of the scope of EHSS functions. Continuous Improvement (CI) practice, not as a function but as a form of competence and skill is a domain within application engineering possible of enhancing developments in environmental impact and is an opportunity to ‘up skill’ engineers. Graduate or Talent development programmes using professional competence frameworks such as the Engineering Council’s “UKSpec” strategy as a guide for developing engineers have also accounted for the need to accommodate developing ‘environmental awareness’ and generate opportunities to ‘incentivise’ professional registration at all levels. In practise it is a tricky area to develop but thinking more smartly has been successful within Invensys’s own Graduate and Apprentice programmes.

3.1.3 Sociological Effects

The previous discussion impacts on this, in that, modern competence management and resourcing functions need to appreciate the changing social norms of the latest generation of engineers. SEMTA’s report indicates a gap in the numbers of students wishing to enter into an engineering career but there are additional challenges that must be faced if we are to engage this generation for an extended period allowing a business to get value while developing their talent. For example, it is clear that values and culture are more important to the engineers of today and tomorrow and talent will readily look for opportunities to move between companies and industries if the social identity of the individual does not fit that of the business (Haslam, 2004).

Previous generations have had the ‘luxury’ of having a job for life in the rail industry, particularly in the area of signalling design. There is a wealth of knowledge and skill that needs to be shared and nurtured to be sustained. The age profile of signalling engineers would tend to concur with the view that we have a maximum of ten years before a critical mass is reached in terms of sustainable capability and capacity if there is no concerted effort to reverse the trend.

In managing competence it is worth noting that developments in technology are not directly proportional to the numbers of people required to develop and apply them in projects. Some may miss an opportunity but developing technology is directly proportional to the numbers of initiatives and strategies required to support them. This means understanding the social demographic of our future workforce. Developments such as design automation will impact on resource requirements across a range of engineering domains in simulation,
programming and application design, to name but a few. Those of us who advise and manage on capability and capacity must recognise, identify and be capable of developing strategies to deliver a competent and appropriately behaved workforce.

The preceding beliefs consider a more in depth understanding of our future talent and will require innovative strategies to stay ahead of the game. There might be or might not be (Eisner, 2005) an emphasis on a life of jobs rather than a job for life for our future engineers but, as technology moves forward, the gap between industries begins to close and those skills required by signalling design, for instance, may be recognised by other industries as transferable with minimal ‘lead time’. Yet this risk also offers the rail industry opportunities to diversify its demographic in the other direction while maintaining its core skills through smart workforce planning within businesses and professional licensing and accreditation.

Increasingly, soft skills are proving to be areas where businesses are looking to develop their resources. Organisational development and business function, often seen as a ‘soft sciences’ are being used to engineer workforces and shape businesses to meet the resource demand and supply pipeline. With this, there would appear to be an opportunity to explore the behavioural requirements and aptitude of our future rail engineers and truly understand what is needed, where and by when.

3.1.4 Technology

Political, socio-economic, legislative and environmental pressures are forcing through relatively rapid change in thinking for national and metropolitan rail systems. This can be seen with the likes of CBTC and ERTMS which have been permeating the railways of the world in response to the need to standardise solutions, drive down whole-life costs and improve capacity and flexibility. In the continued drive to extract all available capacity and efficiencies, main lines are embarking on the roll-out of advanced traffic management systems and Automatic Train Operation.

Those involved in conceiving and developing new technologies must be cognisant of the real-world application and constraints. And of course, the rate of change of technology must be matched with an achievable plan for up-skilling. Whilst many of the initiatives (such as ERTMS, modular signalling, intelligent infrastructure, traffic management) seek to reduce some of the elements (physical and design) that are traditionally considered the ‘interesting bits’ of signalling engineering, signalling principles still form the backbone of any train control solution and application design skills and knowledge certainly have a part to play in this development. Likewise, other project lifecycle domains such as project engineering and testing are likely to have to have multi-skilled employees to manage and integrate more complicated systems with legacy technology that will remain for some years to come.

Managing knowledge and skill transfer in ever more challenging projects will prove to be a good win for comprehensive competence management processes although legacy technology will remain an important point to consider throughout the change. ‘Overlay’ ETCS systems coexist with existing technologies that are not due to be replaced for years to come and will require the careful maintenance and management of important knowledge and skills sets. This knowledge may go the other way and actually force our future engineers to ‘go back to basics’. In the same way that a trainee pilot continues to have to be able to read a map and do speed/distance/time calculations, despite GPS technology, our future engineers will still be required to appreciate and apply signalling principles and practice to modern train control solutions.

3.1.5 The Law, Compliance and Standards

A business operating in a safety critical environment will be governed by many, many legal and moral obligations in the execution of its works. The Office of Rail Regulation (ORR), being the highest UK authority with a remit covering economic, health and safety regulations of the railways, is itself following legislative Acts; no less than 16 at the last count and not including those that sit outside the UK.

There are positive things to take out of this: defined structure as to how the national rail infrastructure is governed and, derived from this, standards and licences through the rail operators and suppliers. Structure proves to be a guiding light and saving grace and provides those in competence and development functions with frameworks from which they can build robust processes to develop and maintain teams of competent people. Understanding the ORR’s roles such as “securing delivery by the industry of its regulatory obligations” and its strategic goals for 2009 to 2014 will give the competence management professional in the rail industry food for thought on where the focus is, what needs to happen (ORR, 2012), by when and what skills are required.
Future changes to legislation will have an effect on how competence is managed, how licences will need to adapted and what behavioural requirements will be necessary to keep people safe on the railway. There are certainly other institutions and bodies exploring the opportunities and challenges such as the Institution of Railway Signalling Engineers (IRSE), National Skills Academy for Railway Engineers (NSARE) and Association of Railway Training Providers (ARTP).

The push toward new technologies on the railway actually gives companies, Network Rail and London Underground opportunities to influence and shape regulation, to a certain extent, and keep it forward thinking. As new tools, processes and technologies develop, competence management must maintain a firm grasp on the context of those changes, and develop suitable methods and strategies to rise to the challenge.

So, how do we use existing infrastructure to teach, train and maintain competence? What tools do we need to develop people’s skills and knowledge? Do people accept that we must be more efficient and aware of cost? Are our processes too complex even given the safety critical nature of our business? These are all questions that must be asked if we are to take the initiative and develop competence.

A push to reduce operating costs as a result of pressure from customers who require new or replacement infrastructure is generating innovative strategies for resourcing. As a consequence, this has an effect on competence management in an industry already aware of and struggling to get people through the door.

Customers of the railway demand better quality, a more efficient and professional service and all at a lower cost. Why not? It is their and our right, as users, and has already had an impact in other industries outside of engineering and manufacturing and has created ‘supermarket wars’ and bulk buying groups such as ‘Groupon’. In the case of Main Line rail engineering funding is always an issue and it is closely monitored by a government who holds some of the purse strings and where value for money is at the heart of policy and targets. Project milestones and programmes are pushed to the limit, in some cases, by people who have neither the knowledge nor experience to decide on those issues.

But, again, this forces us across all area of business to be more innovative and smarter about how we do our jobs. Of course there is going to be a ‘tipping point’ but we should not always assume that the next cut or push will be the ‘straw that broke the camel’s back’. The economic challenges, as with all the other areas discussed up to this point, are risks, should always be managed as such and mitigated against especially in competence management strategies for the future.

4 RECOMMENDATIONS

Most competence management processes and systems pick up many of the areas talked about in this discussion. The drive to increase efficiencies, standards and quality is a good thing but requires competence management professionals, and the activities they manage, to keep up. The area of competence management falls into the domain of capability and capacity management by virtue of the cliché ‘the right people, in the right numbers, at the right time, in the right place.’ It is in having a deep understanding and appreciation of the numbers of resources that will decide the best strategies and changes to how competence is managed in the future.

Commercial companies are built on being viable and profitable enterprise that makes predictable and healthy returns for all their stakeholders (shareholders, board, and employees). This, coupled with the expectations of reduced prices from customers, drives more pressure to protect and grow margins by driving to decrease operating costs. This impetus requires more out of our engineers in terms of how they operate within the project delivery environment. Work packages require better planning early on in the delivery lifecycle and this means that the knowledge and skills of our engineers has to grow to successfully play its part in returning improved performance and results. We should multi-skill and up-skill our engineers. Not only technological skills but in commercial and project management domains. Allow them to engineer the complete solution rather than simply the technical bits. New strategies for project delivery, including closely monitored Work Package Management, facilitates this and presents new opportunities to realise benefits in terms culture, tools, process and competence across all domains over time.

The competence management professional must identify where similar knowledge and skills sets can be found; what other domain and industries, if we really looked at them, do similar things to ourselves but in a different context? This is not simply the obvious candidates such as aviation and other transport systems but construction, financial services and technology businesses. Robust Training Needs Analysis (TNA), using tried
and tested methodologies such as the Systems Approach to Training (SAT) will identify common and non-common knowledge skills and behaviour and provide auditable and repeatable results and provide reliable information to feed competence management systems.

Professional bodies like the IRSE have already identified competence requirements and the wheel should not be re-invented or made more complex by starting again. This is more about evolution rather than revolution by having a focus on the future.

Those who manage competence processes and systems must be aware of the impact on their environment if they are to be successful in turning sales prospects into real work.

Before competence can begin to be managed it is the duty of those carrying out the task of developing employees to fully understand, and have driven the development of, the supporting tools and processes that will be required. They must ensure that that they are in place and that they know what culture is required to make projects a success. Given this, formal training needs analysis (TNA) must be more relevant, robust and sure of meeting the business requirements over the short, medium and long term.

In practice, competence management requires an understanding of the resourcing demands of a business; this will affect the strategy for defining the shape of the business including who needs what skills and how many.

This takes the function of competence management in a new direction. There is a requirement to be more holistic in the approach, moving beyond concentrating on TNA, and considering capacity requirements. This works on two levels: capacity in terms of ‘heads’ in a business and, more specifically, in thinking about peoples’ capacity to do work and how we can improve and increase it. This doesn’t mean asking employees to do more work in terms of hours. This is about developing the extra knowledge and skills to make their day more efficient and safer.

5 CONCLUSION

Competence management must adapt, be flexible and agile. There are many sources of information pertaining to this area of business, providing advice, selling tools or conducting analyses.

For those who practise in this domain there is the need to understand the whole picture of the industry and context in which their business operates in an effort to remain relevant and add value.

Competence management itself, supported by appropriate enablers such as reporting programmes and resource databases is really about being able to define capability requirements in an organisation far enough in advance to support the current and future workbank; building a broad knowledge of the lifecycle of the business in order to ask the right questions of the right people. Are the tools to support the job available, is the process there to support the work and is the culture of the business suited to the nature of the business in its current and future objectives?

You will notice that the act of competence management is often supported in this discussion by the words ‘process’, ‘tools’, and ‘culture’. This is deliberate. Many competence management systems can automatically identify the point at which competence can be initially developed, re-affirmed or appraised based on the process of earlier analysis. However, the systems and enablers i.e. the competence frameworks, will only be as good as those who have provided the inputs to the system. In the future, particularly in the rail industry, those inputs must be robust enough and reliable enough to generate real people, with real skills, in the right numbers to maintain and develop our national rail infrastructure and do it safely with our customers and stakeholders at the forefront of our minds. Competence management must span the tactical and strategic domains in order to plan, monitor and control successfully within the industry. Those who are charged with this must have an ability to translate business performance requirements into engineering knowledge, skill and behaviour to create results where everybody can see the benefit, from shareholders to leaders and, most importantly, our customers.

6 BIBLIOGRAPHY


