Maximizing Multi-Disciplinary Team Impact in High-Performance Sport: Exploring Problem Solving, Decision-Making, Expertise, & Team Performance.

Part 2: Performance Problem Solving

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Overview

In recent years, there has been a significant shift in the requirements of the workforce to meet the changing needs of industry and society. The emergence of the knowledge era has created new frontiers that are much more complex, inter-connected, and inter-disciplinary in nature, requiring individuals, teams, and organizations to work together to identify and solve our most difficult questions and thorny problems. This is especially true in the field of high-performance sports where Multi-Disciplinary Teams (MDT) are tasked with supporting athletes in achieving their performance goals. However, it is essential to determine if practitioners in MDTs are trained to be 'skilled doers' or 'knowledge workers' who engage in deep cognitive work to produce novel, creative solutions to complex problems. In this paper, we explore the expertise of a Multi-Disciplinary Performance Support Team engaged in performance problem-solving and delivery of services, examining the different problem types, and discussing how practitioners can differentiate between them. Additionally, we will review problem-solving classifications in industry and explore how they can be applied in the context of MDTs to help practitioners expand their vocabulary and approach to problem-solving.

Practitioners in Multi-Disciplinary Performance Support Teams: Are they practical doers or innovative problem solvers?

Are practitioners trained to be ‘skilled doers’ using applied skills and knowledge through repeatable, actionable processes and procedures or conversely, are they ‘knowledge workers’ engaging in deep cognitive work to produce novel, creative solutions to complex problems (Childs & McLeod 2013; Collins et al 2015) through the application of knowledge, heuristics (Blumenthal-Barby & Krieger 2014). and mental models? How would we define expertise of a

Multi-Disciplinary Performance Support Team engaged in performance problem solving and delivery of services? An S&C coach coaching a squat or a physiotherapist treating a specific injury is through a defined process of skilled knowing and is not by its nature 'problem solving'. Similarly, the MDT working through its daily processes is unlikely to come across or need to solve complex multifaceted and new problems nor are they likely to be set up to do so. In the first instance it might be useful to differentiate between problem types.

Manufacturing or knowledge work

Skilled doing

In recent decades there has been a significant change in the requirements of industry and the workforce that serves it. Previously, we were generally industry focused with emphasis being placed on individuals having skills, tools and knowledge that enabled them to create and manufacture things. Workers were required to learn tasks, skills, execute defined processes and then repeat them. This 'skilled doing', once learned, did not present much opportunity to interact and engage with others to problem solve, be creative or use innovation nor was it required. When tasks and labour can be distilled down to routines, processes and checklists it is unlikely that individuals with high cognitive abilities would be required or indeed be useful to achieving the outcomes (Shraw, Dunkle & Bendixen 1995).

The information age and Knowledge Work

We have for the most part moved away from large scale industry, manufacturing and its workforce methods and practices. New technologies, immediately accessible information on any subject, vast amounts of data extracted through a variety of methods alongside sophisticated techniques to interrogate, visualise and make sense of it. The tidal wave of knowledge in a society that is highly informed and educated has created a significant change in what we know and how we work. Science has answered many of its 'lower hanging discipline-specific questions' with the new frontiers becoming much more complex, inter-connected and inter-disciplinary in nature. The tasks of the knowledge age also differ from that of the industrial era and include innovating, problem solving, predicting, evaluating, verifying and strategizing (Page, 2017), all of which must be underpinned by purposeful and deliberate processes to be skilfully executed. Science, technology, engineering, defence, intelligence and think tanks all support collaborative working because in the knowledge era, it is recognised that teams from diverse backgrounds provide more and better solutions to the problems of our new age (Hong & Page 1998; 2004).

These trends have created a step change and moved us into the era of knowledge work, where individuals, teams and organisations are expected to work together to identify and then attempt to solve our most difficult questions and thorny problems (Mello & Rentsch 2015). This renders many of our individual 'skills and abilities' apparently redundant,

no longer applicable or useful. We need individuals that possess knowledge and skills which when applied, can help to identify, and solve new and novel problems (Mello & Rentsch 2015). These are not obvious mundane tasks that just need to be done, these are the difficult problems of a new age where the solution lies hidden in complexity and requires hard cognitive labour (Mitchell et al 2016) and emerging knowledge (Mitchell et al 2009) to unlock.

A skilled workforce?

We have pivoted away from conventional ideas about what skills and abilities workers need to be successful today and yet we still implement tried and tested approaches to training and daily working routines. Some of the most sought-after skills in industry today, recognised both by employers and educational institutions is the ability to problem solve, communication, interpersonal skills, critical thinking/analysis and cognitive skills (Gavin & Roberto 2001; Roberto 2004). In higher education these are called nested skills and are taught 'implicitly' through the curriculum which is heavily still focused on the harder technical capability. This narrative fits comfortably with the expectations of the knowledge worker era and yet, where do individuals, practitioners and teams purposefully learn, practice, reflect upon and develop these critical skills (Schum 2000)? Are these the 'soft skills' that we can take or leave often quickly dismissing in favour of the hard technical skills, noticing them only when we hit relationship obstacles and setbacks (Reid et al 2004; Roberto 2004)? To learn these skills do we need to move beyond the learning on the job methodology that is currently adopted to a more deliberate and explicit method?

Is skilled doing dead in sport?

Alongside this, do we also need to acknowledge that there is still a significant need for skilled doing? Has the narrative supporting the need for creativity, innovation and problem solving diminished the readily available, unpackable solutions that already exist and, in some instances, has unwittingly moved us a way from delivering the basics (Milkman, Chugh & Bazerman 2009). Have we become so clever and evolved in our approaches that we struggle to see the obvious, forgetting first principles and the methods that these 'new and novel approaches' should be built upon? Alongside this, how does the problem-solving practitioner emerge and are they really required? In the world of high-performance sport, do individual practitioners deliver a service of skilled doing or does the team work together to truly problem solve (Shraw et al 1995)?

Classifying Problems

There are several approaches to problem solving classifications in industry that could be borrowed to extend our vocabulary in elite sport high performance support contexts. First, we must differentiate between *tame/simple* problems, those with an available, obvious, and tested solution and those that are *wicked*/complex (Childs & McLeod 2013; Walinga 2017), where the problem requires deep analysis, deliberation and the solution might not be

effective and is certainly not guaranteed. Kitchener (1983) argues through his three stages of cognitive processing, that there is '*well'* (singular guaranteed solution), and '*ill-defined'* (multiple – nonguaranteed solutions) continuum in which the complexity within the problem increases as we move towards the latter end. Edmondson (2012) similarly reviews problems solving through a process-knowledge continuum where practitioners can engage in either routine or innovative operations where the uncertainty of the outcome increases as we move towards more innovative solutions.

The nature of problems

When a problem is 'simple/tame' it is likely that there is an obvious, ready-made, and available solution that will when executed, simply and quickly address the issue whereas with 'wicked/complex' problems, there is likely to exist volatility, uncertainty, complexity and ambiguity (VUCA) (Johansen & Euchner 2013). In the world of VUCA wicked problems, no clear answers exists and there will likely be multiple options to address the ambiguous and everchanging problems identified. Due to the integrated complexity and coupling between elements/disciplines/tools and variables that exists, there might also be unintended consequences to our actions as it is hard to see how affecting change at one point in the system, effects other dependent elements (Rijpma 1997).

Charles Perrow's (2000) Normal Accident Theory (Weick 2004) argues that the greater the inter-dependency between systems and the tighter they are coupled, the more complexity exists increasing both the challenge of identifying problems and discovering solutions to address them. This is very similar to the Cynefin Framework (Childs & McLeod 2013) where we can plot problems into four quadrants of clear, complicated, complex and chaotic based on levels of coupling between systems, processes and/or operations.

Can we apply problem solving classifications in elite sport?

Differentiating structures and methods to help solve problems exist in other industries and professions. It seems that in Sports Science, Medicine and Coaching these methodologies and ways of thinking although perhaps implicitly understood, have not yet been fully adopted or worked into our multi-Disciplinary ways of working (Mello et al 2015; Mitchell et al 2016; Reid et al 2004). If we purposefully consider the types of problems that practitioners, MDTs and organisations face, we might be closer to establishing purposeful methods and clear processes to solve them.

Wicked Problems

Problems that are truly wicked will by their nature require time to identify before beginning to understand them (Rittel & Webber 1973). VUCA and wicked problems, depending on an individual's perspective or their domain of expertise, can be broad in that they have cross system inter-dependencies which increase overall complexity and

due to inter-system reliance (sometimes called coupling) it is often not clear how to establish where issues lie (Sediri, Trommeter, Franscaria & Fernandez-Manjarres 2020). Rather than looking at VUCA problems as the interaction of systems on a macro scale, we can consider them also on a micro-level (Sae-Lim 2019). Think about hamstring injury pathology as it relates to the musclo-tendinous function in a specific skill such as accelerating or sprinting, this too could be VUCA, requiring true MDT 'problem-solving' despite being considered simple, obvious, well understood with a variety of recipe like approaches to resolving. These examples highlight the complexity component of VUCA problems.

In situations where the output of an intervention, action, task or process might be different depending on the context or ecology can be considered volatile. Just like markets can be volatile in periods of global uncertainty, so can how athletes respond to training, treatments and performance on a day-to-day basis. Uncertainty is simply not knowing what is going to happen. In Performance Support Teams there is high levels of certainty in the collection and visualisation of GPS data however, our ability to interpret that data and decipher insight that is useful in informing decisions that will impact events in the future, is likely uncertain or at best, guess work. Prediction and forecasting (Goldstein & Gigerenzer 2009) in an uncertain dynamic environment might be expected but is very difficult, especially with the consequences that surround bad decision making in high stakes performance environments.

Practitioners as skilled doers

As an extension of this thought, are practitioners in the business of enacting and performing processes that are in fact tame, simple, routine and well defined? Deploying GPS, monitoring load, capturing a variable, collecting a data sample does not require practitioners, once the skills are learned, to break out of normal procedures, processes and operations nor does it, through visualising data or interpreting it necessarily give insight or inform the routines from which the data was acquired or even why. In complex systems how can we use data to better predict future events (Lanceley, Savage, Menon & Jacobs 2008), inform decision making and generate insight that might aid us in adapting what we do into the future and identify problems to solve?

Using data as a window to peer in to or predict the future with a view to deploying true problem-solving methodologies in high sporting environments is a fickle business. Do practitioners have the critical and analytical skills to be problem solvers, do they really need to be and are they set up and supported in ways that facilitate this? As a transcendent question, do our education programmes, where coaches and practitioners develop hard technical 'doing' skills that exist in silo's, enable effective integration of skillsets (Hall & Weaving 2001; Mesmer-Magnus & DeChurch 2009) and their application in situations where the outcomes are not predictable? By staying in our metaphoric 'discipline specific' lanes and steering

clear of the inter-disciplinary highway, do we (or can we) ever really problem solve?

Are Sports Organisations stuck in the past?

What of sports organisations, do they enable and embrace a problem-solving approach? It is very unlikely in elite sport that organisations are prepared to break away from the established routines, processes and way of doing things. So much importance is placed on the outcome in elite sport. Inevitably different methods, ways of doing things and new approaches that could be introduced presents significant risk. Novelty challenges the very fabric of sport and its socially discursive origins; this is very difficult for those who have been indoctrinated into the sport and for the decision makers to embrace. There is much reliance on the coach to provide the performance answers, their methods, knowledge and experience is often a secret sauce where the ingredients are hidden and the process tacit (Nash & Collins 2006). This again might be thought of as skilled doing – the application of a process rather than problem solving to deliver the performance solutions.

MDT Structure

As one final consideration, are the technical and MDTs structured in such a way that novelty, creativity, innovation and problem solving can flourish (Reid et al 2004)? In most cases the performance process is 'coach led' which makes it hierarchical and at times transactional as the MDT seek to learn the philosophies, methods and approach of the coach. Alongside the structuring of the team, what is the climate in which they work? In high stakes, high pressure, time constrained environments how do organisations and teams ensure how they work together fosters problem solving capability (Milkman et al 2009).

Team climate and hierarchy

Ideation time and support, debate, challenge, freedom, trust, conflict and risk taking are all constituents of healthy climates in which problem-solving approaches can flourish (Proudfoot, Jayasinghe, Holton, Grimm, Bubner, Amoroso, Beilby, J. & Harris, 2007) but does this emerge by accident or purposeful design (Garvin and Roberto 2001; Jackson et al 1995)? Practitioners aspiring to work in high performance environments can be sure that they will have to work as part of a team and yet, the skills that create effective interpersonal interactions and the approaches to problem solving in teams are not explicit or part of the current vocabulary (Reid et al 2004). There is a churn of practitioners in many elite sporting organisations, a high turnover of staff and in many cases, practitioners who are young and poorly paid. This likely breed 'learning on the job', deference to more experienced staff and subservience to those perceived to have more decision-making responsibility such as the head coach, head of performance or clinicians. For practitioners to keep their job, it is easier to simply perform the technical competencies and functions required in the role. To ask challenging questions, disagree, suggest

alternatives or have answers that challenge the hierarchy or those who usually provide them, is a high-risk approach for many. This thwarts problem solving approaches (Roberto 2004), amplifies behavioural issues and holistically reduces impactful and constructive dialogue (Kerr et al 2004).

Does MDT working create unwanted system complexity?

Is there a contrasting perspective where MDT working can deliver sub optimal outcomes (Reid et al 2004)? Sports organisations being creative, driving innovation and working through multidisciplinary teams could perhaps inject complexity into both process and approach. The need to work as part of a multi or inter-disciplinary team, creating 'blended' approaches can increase complexity due to competing views, beliefs, understanding and methods across different disciplines within the team (Foire, Hoffman & Salas 2008). Practitioner attempting to be cutting edge and showcase 'innovative or novel' methods, could also reduce the clarity and specificity of the interventions and how they align when delivered. As a result, practitioners, who haven't fully grasped their specific role in a dynamic/complex system, find it very difficult to adopt the objective evidence-based methods they have been trained to deploy (Wallinga 2017) thus, making it near impossible to articulate or discover the true impact of their discipline specific interventions.

The large gap between the 'skilled doing' and 'problem-solving' practitioner is not getting any closer and in fact, the mismatch between the two drivers is perhaps making the murky complex and ambiguous requirements of Multi-Disciplinary Team working even harder to navigate (Foire, Rosen, Salas, Burke & Jentsch 2017). Practitioners have become unwittingly responsible for the performance outcome rather than the process that delivers it, and this 'creep' might be the product of a lack of role clarity, role delineation and role definition with clear objective, measurable and tangible targets. The '*it depends*' and '*its complex*' narratives that have permeated our practitioners vocabulary seem to justify low clarity on process (Collins et al 2015), ambiguity in approach and a lack of accountability. This cumulates into situations where we have 'accidental' outcomes with low repeatability rather than purposeful process through deliberate design.

How much problem solving is required?

Before adopting the rationale that problems differ, that they can be classified and that we need to deploy different strategies to solve them, perhaps, we first need to consider whether MDT practitioners are looking for novel problems to solve? Do practitioners operate in complexity and chaos using ill-defined adaptable innovation or are they required to use simple, well-defined routines, procedures and solutions (Shraw et al 1995)? Conversely, could it be that practitioner's apply complex, over-designed solutions to well defined problems when not needed?

If we consider that there is a difference between skilled 'doing' and knowledge based 'problem

solving' work (Nokes, Schunn & Chi 2010), we must first establish what delivery looks like on a day-to-day basis. Do practitioners have to continually face new and novel problems with no clear solution or are they involved in an ongoing process of doing? It is likely that within disciplines there are embedded and consistent delivery features and that cross-disciplines, there is meetings, cross pollination of ideas and information sharing (Foire et al 2008) however, inter-departmental discussions do not constitute an inter-disciplinary approach and the blending of skill sets to identify and solve problems (Hall & Weaver 2001). This perhaps raises a question. In asking skilled practitioners to work in a Multi-Disciplinary Team way, could this be a catalyst that introduces both the interdependence and coupling from which complexity emerges and is this required against the backdrop we have created in the paragraphs above?

Perhaps it is when there is a break from normal routines and delivery operations that we nudge to more VUCA scenarios. Consider the chronic ongoing injury issue, the athlete that keeps breaking down through illness or the multifaceted performance problem with competing technical, physical and performance related factors. There will be situations where the answer doesn't lie firmly within a discipline and the solution with one practitioner. It is situations like these where skilled doing won't provide the solution and we will have to develop a blended cross-discipline approach to find the answers.

Summary and Conclusion

The paper discusses the expertise of multi-disciplinary performance support teams in problem-solving and service delivery. It examines whether practitioners are trained to be skilled doers or knowledge workers and how their expertise can be defined. The paper also explains the difference between manufacturing or knowledge work and how the era of knowledge work has created a step change in the way individuals, teams, and organizations are expected to solve problems. We have argued that conventional ideas about what skills and abilities workers need to be successful are no longer applicable, and we need individuals that possess knowledge and skills to help solve new and novel problems. Finally, the paper suggests that several approaches to problem-solving classifications in industry could be borrowed to extend the vocabulary in elite sport high-performance support contexts.

About Blended Intelligence

Blended Intelligence is not just a consultancy service, it's a game-changer for high-performance sports organizations. By leveraging the power of diverse teams and innovative technology, Blended Intelligence enables collaborative problem-solving and delivers tailored solutions to complex performance challenges. With a focus on shared intelligence and a commitment to maximizing competitive advantage, Blended Intelligence is helping teams think differently and achieve brilliant outcomes.

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