CONTENTS

Introduction & Using the Guidelines 4
Management Summary 6
Overview of Research Methods and Findings 8
Virtual Working is Fundamentally about Synchronicity 11
Understanding Team Performance 14
Getting in Tune with Asynchronous Working 18
  Management / leadership style 18
  Personality 21
  Task co-ordination 25
  Cohesion 27
  Communication richness 29
  Trust 32
  Work relationships 36
  Cognitive bias 38
Skills and Attributes of Effective Virtual Teams 41
Appendix – Sources 44
INTRODUCTION

Background – the march towards virtual working
Over the last 18 months the topic of ‘agile’ or ‘virtual’ working has been in the spotlight following decisions by several prominent American leaders in the technology sector to bring their people back into the office.

So in July 2014, the AWI Research Group undertook a review of academic research relating to the management and operation of virtual workforces with a view to identifying the best understanding and advice in relation to the operation of agile / virtual teams.

The drive for virtual working has come as a consequence of increasing pressure on companies to be more responsive to change, reduce their operational costs and respond to staff desires to have more say over when and where they work. Within the definition of ‘virtual working’ we embrace:

- Working in different physical locations (base office; other company location; 3rd party or partner location; home; on the move; café; hotel etc.);
- Working in different time zones (where organisations use different territories to follow the sun or to recruit the best resources from specific market places or service geographic markets)
- Working at different times (shift patterns, job share, compressed hours, flexitime, part time)
- Geographically distributed teams

AWA and the Centre for Evidence Based Management (CEBMa) undertook a Rapid Evidence Assessment (REA) of available research in order to provide Sponsor organisations with the best evidence to guide their own management and virtual teams in best practice techniques and approaches.

Acknowledgements
The authors would like to thank everyone that has contributed to this research project – AWA’s team members; CEBMa – particularly Eric Barends, Professor Rob Briner, Jo Rick and Bart Van Der Ven – and the Project Sponsors for contributing to the thinking and providing valuable feedback and inputs.

Using the Guidelines
These have been produced to provide a detailed understanding of the various aspects and concepts studied, giving practical guidance on each aspect. Here is a summary of the Sections – allowing the reader to follow their own areas of interest and focus.
<table>
<thead>
<tr>
<th>SECTION</th>
<th>WHO SHOULD READ IT AND WHY?</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Summary</td>
<td>An overview of what was found and recommended through the research - including the top ten things to know about virtual working.</td>
<td>5</td>
</tr>
<tr>
<td>Overview of Research Methods and Findings</td>
<td>The REA results are included in this report. If you need a recap or a high level understanding, this is for you.</td>
<td>8</td>
</tr>
<tr>
<td>Virtual working is about synchronicity</td>
<td>A short discussion about what synchronicity means and a counter to the notion that &quot;together is best&quot;. Useful for those presenteeism discussions.</td>
<td>11</td>
</tr>
<tr>
<td>Understanding Team Performance</td>
<td>Want to know how virtuality impacts the Six Factors linked to Knowledge Worker Productivity? See how they can be damaged and what to do.</td>
<td>14</td>
</tr>
<tr>
<td>Getting in Tune with Asynchronous Working</td>
<td>Management style, personality and contextual factors – we describe and explain their importance to virtual working and provide practical ideas from research and our experience. If you want an in depth understanding of any aspect, this section will help you explore and think about what you already do / what you could do.</td>
<td>18</td>
</tr>
<tr>
<td>Skills and Attributes of Virtual Teams</td>
<td>A high level checklist of skills, attributes and practices used by virtual teams – things to think about and build into your virtual team practices.</td>
<td>41</td>
</tr>
</tbody>
</table>
The research has brought forward a great many detailed findings which are set out in this Report and which we hope will help our Sponsor organisations in the evolution of their working practices.

At a high level, we have sought to make sense of the findings and put them into an overall context, as follows:

1. In a ‘traditional’ model of work in which people attend the office every day and are located together with their immediate team mates there is a very rich data ‘soup’ of information which in a very unconscious way enables people to know a great deal about each other and their context. They have the opportunity to meet face-to-face, share information and develop/maintain relationships. This face-to-face communication enables nuances to be discerned related to physical condition, mood, tone and enthusiasm. In many ways people don’t have to ‘trust’ in an unquestioning way because there is lots of rich information about what’s happening with the individual, the team and the social and physical context.

2. In the more asynchronous ‘virtual’ world in which people are not all together all the time, team members are deprived of a lot of the information upon which to make judgements and so it is necessary to manage trust in a very conscious fashion. We have to select people who have a high chance of ‘trusting’ and we have to make that which is implicit (psychological contract) explicit and we need to work to maintain close psychological proximity (consciously managing the relationships we have). In other words, the traditional office allows teams and leaders to ‘get away’ with ambiguity and poor practices in a way that is very destructive when applying ‘virtual’ or ‘agile’ work.

3. ‘Virtualness’ isn’t exclusive to people who work away from the office, however. In fact most people who work in a traditional fashion can only have close relations with a relatively small number of people within close physical proximity to themselves. Arguably they have little or no opportunity for rich serendipitous relationships outside their team or floor. Consequently anyone that comes to the office every day and for some or all of their time is part of a cross-functional team where the members are dispersed across a large building is in fact ‘virtual’.

4. So the ‘virtual’ management disciplines that we need to put in place to replace the rich soup of the office for people who work away from the office are also necessary for people who adopt ‘traditional’ ways of working but who do not share the same physical environment every day. The focus of these disciplines are to ensure the development and maintenance of team relationships, working practices, explicitness and clarity – all the things that can go bad quickly when we don’t pay attention to them.

5. In the early days of ‘virtual working’, asynchronicity meant a dilution in the information and communication richness experienced by team members when working away from the office, because ‘remote’ ways of working were only supported by email and telephony.
However in recent years with the advent of cheaper and cheaper computing power and collaborative technologies such as Skype, Lync, Yammer etc. the richness of communication is on the rise, making some of the perceived challenges of virtual working less valid.

6. **Psychological proximity**, the feeling of being close to someone is another interesting concept that is impacted by asynchronicity. Popular belief is that the geographically further away you are from someone the less you will feel in close psychological proximity. Whilst this has traditionally been the case, it is becoming less so as people use tools like Lync, Skype, Twitter and Yammer to create trust and a feeling of closeness whilst they aren't physically together. The complexity of problems and concepts that are now being worked on by teams who do not share the same physical space using these rich IT tools is also on the increase.

<table>
<thead>
<tr>
<th>Ten key findings from the research</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Virtual working damages team performance unless you understand and prepare for the differences. Sadly many companies do nothing to prepare or assist people – trusting to luck.</td>
</tr>
<tr>
<td>2. Virtual working isn't just about working away from the office. It's being separated from colleagues in time / place – meaning most of us work virtually to some degree.</td>
</tr>
<tr>
<td>3. In virtual teams <strong>everyone's a leader</strong>. Teams should agree and role model desired behaviours, taking responsibility for team success rather than leaving everything to the manager to determine.</td>
</tr>
<tr>
<td>4. Trust impacts the cohesion, communication, work relationships and performance of virtual teams. <strong>Without trust, you're sunk!</strong> Everyone needs to manage and demonstrate trustworthy behaviour.</td>
</tr>
<tr>
<td>5. Virtual teams need skills, experience and the right mix of personalities. Perhaps you can't alter the mix, but you should understand it and put measures in place to mitigate any issues.</td>
</tr>
<tr>
<td>6. To manage a virtual team, you need to <strong>give and receive trust</strong>. It lies at the heart of what delivers a great virtual team performance.</td>
</tr>
<tr>
<td>7. Virtual teams must understand and address the risks of communicating remotely, which can lead to misunderstanding, conflict, delay and lack of clarity.</td>
</tr>
<tr>
<td>8. When forming a new virtual team, choose members and leaders carefully and put your efforts into <strong>building good relationships</strong> - fast tracking the development of trust between members.</td>
</tr>
<tr>
<td>9. Of the <strong>Big 5 personality traits</strong>, conscientiousness, extraversion and agreeableness closely relate to team performance. Get the right mix or at least be aware of the consequences and work with them.</td>
</tr>
<tr>
<td>10. <strong>We're all prone to bias</strong> – we judge others on insufficient evidence, particularly when we don't see them often. Be alert to this – once a biased conclusion is drawn, the tendency is to stick with it!</td>
</tr>
</tbody>
</table>
OVERVIEW OF RESEARCH METHODS AND FINDINGS

This section contains an overview of the methods used by CEBMa to conduct the Rapid Evidence Assessments of the questions posed within the Research. A main question was posed, supported by some supplementary questions to enable the main question to be answered fully.

<table>
<thead>
<tr>
<th>Main question:</th>
<th>What is known in the scientific literature about effective strategies for managing the agile workforce?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>What counts as an agile (remote/distributed) team? How (and why) is a virtual team different from a traditional one? Why do organisations deploy virtual teams?</td>
</tr>
<tr>
<td>2.</td>
<td>What management styles and practices are known to influence the performance of agile teams?</td>
</tr>
<tr>
<td>3.</td>
<td>What personal characteristics of team members are known to influence the performance of agile teams?</td>
</tr>
<tr>
<td>4.</td>
<td>What contextual factors are known to influence the performance of agile teams?</td>
</tr>
<tr>
<td>5.</td>
<td>How are the benefits of agile teams measured?</td>
</tr>
</tbody>
</table>

Search strategy

The following databases were used to identify studies: ABI/INFORM Global from ProQuest, Business Source Premier from EBSCO and PsycINFO from Ovid. The following generic search filters were applied to all databases during the search:

1. Scholarly journals, peer-reviewed
2. Published in the period 2000 to 2014
3. Articles in English

It was important that studies carried out in a wide range of cultures could be included, in order to see what cultural aspects were found to be of significance. It should be noted that the requirement for the research to be in English does not constrain the inclusion of research conducted in countries where English is not the native language. The requirement is that the research is published in English and since there is a focus in academia to have work published in international academic journals and read by a wide range of academics – English tends to be the language of choice, in order to maximise the size of the audience.

A search was conducted using combinations of different search terms, such as ‘agile teams’, ‘virtual work’, ‘mobile work’, ‘leadership style’ and ‘personality’. Ten different search queries were used to screen the titles and abstracts of more than 500 studies.

Limitations: Due to time constraints, concessions were made as to the breadth and depth of the search process, such as the exclusion of unpublished research. Consequently, some relevant studies may have been missed.

Findings:

1. What counts as a virtual team?: The initial use of the term ‘agile’ in the title of the research quickly led to the need to redefine the type of working that the research focused upon. The term ‘agile’, although used in a broad sense in the workplace / ways of working arena, is more often used in the context of software development methodology within the research community. Hence the research team looked at other terms to denote the area of interest (i.e.
where people do not work physically together all the time) and found that the terms more commonly in use were virtual work, mobile work and telework. For simplicity, this Report refers to virtual working / virtual team to denote this way of working. Many definitions were used across the research sources consulted, where generally they tended to consist of:

- Two or more persons, who
- collaborate interactively to achieve common goals, while
- at least one of the team works in a different location, or at a different time, so that
- communication and co-ordination are predominantly done by means of electronic communication media.

Most studies concluded that the difference between traditional / co-located teams and those that work virtually can be expressed in terms of a continuum. Indeed it is difficult to think of teams that work together at the same time, in the same place, all of the time – it became apparent that everyone works virtually some of the time.

**How do virtual teams differ from ‘traditional’ ones?** Research has indicated that there are three principal areas which impact the performance of virtual teams – which require a difference in approach when compared to a team that works largely face-to-face:

- reliance on computer-mediated communication technology – which can result in unskilled team members experiencing ineffective communication and suboptimal team relationships
- physical dispersion and asynchronicity – which makes it difficult for team members to understand the context in which their colleagues are working – leading to misunderstandings and requiring a lot more co-ordination to occur if the work is to be done effectively
- social factors – such as trust, cohesion and relationship building are essential for the effectiveness all teams, but arguably are even more important for those working virtually – where members may not have met face-to-face. There is also a danger that without solid relationships in place, people will draw the wrong conclusions about each other – threatening the cohesion and trust that are vitally important.

**Degree of virtuality:** A number of aspects have been used to determine the degree of virtuality – but Schweitzer and Duxbury (2010) concluded that only two criteria were relevant:

- geographic dispersion
- asynchronicity of communication

Furthermore, they concluded that only one of these needed to be present to determine virtuality.

**Why do organisations deploy agile/virtual teams?** Virtual teams are not new – people have been collaborating across time zones and geographic territories for years. However, this way of working has become much easier with the advent of a range of communication technologies, leading to a growth in the volume and breadth of such arrangements. This has enabled organisations to respond to a range of challenges associated with globalisation, changes in marketplaces and the location of the best resources. Being able to work across time zones and physical locations removes a lot of constraints, enables the best people to collaborate to achieve their goals and service their customers.

**2. Management styles and practices:** Since members of virtual teams are likely to be
knowledge workers, they would benefit from a focus on the factors known to influence team performance — namely social cohesion, supervisory support, information sharing, external communication (external to the team or the organisation), clarity of vision / goals and trust. These factors apply to teams whether co-located or virtual, but it is clear that when people work apart from each other, these aspects need even greater consideration so that they are not damaged through a lack of physical presence. The type of management style, the quality of communications and the perceived psychological distance are all critical to the overall team performance and show that the style of leadership should be matched to the types of outcomes expected from the team.

In terms of management style, it is known that transformational leadership styles enhance social cohesion, whereas transactional styles (which are task-oriented / direction focused) improve task cohesion. Transformational styles are more people-oriented, and focus on relationships, so are more likely to be successful in keeping the team “together” when they are apart.

Clarity of vision and goals are important for all teams, but it is clear that setting clear expectations in terms of communication, deadlines and goals are really important for teams working in more virtual styles and lead to positive team performance.

3. Personal characteristics: As with any team, virtual teams are comprised of people with different personalities, and the team’s performance will be affected by those individual personalities, the way they interact with each other, and the degree to which the blend of personality traits can moderate the degree to which any dominant personalities impact overall team outcomes.

Using the ‘Big Five’ personality traits as a reference point, it is useful to see how they impact one of the key aspects of team performance — trust. When teams work virtually, personality traits such as extraversion, agreeableness and conscientiousness are strongly related to trust and hence to the performance of the team. Extraversion and agreeableness are also strongly related to the propensity to trust others, and this propensity to trust is important at the outset of forming a virtual team.

4. Contextual factors: While many studies showed negative effects on team performance associated with the degree of a team’s virtuality, the aspects studied were not replicated across other research, so it was not possible to generalise. Some single studies showed strong associations between factors such as trust and the quality of decision making; and the degree to which supervisors set more store by the performance they observe directly in the office as opposed to that received when colleagues are working virtually.

A meta-analysis by Lin et al (2008) identified five factors that are closely associated with the performance of virtual teams. These are relationship building, trust, communication, cohesion (task and social) and task co-ordination. It is clear that these all relate to the way in which teams communicate and develop/maintain relationships with colleagues.
VIRTUAL WORKING – FUNDAMENTALLY ABOUT SYNCHRONICITY

The previous Section of the Report suggested that there is no one right way of working in a team. The idea that “together in the office is best” is a flawed notion for many reasons – first amongst which is the degree to which those circumstances even exist today!

While there may be situations where these conditions suit particular teams and outcomes for specific periods – the idea that this is a golden model is not true and is therefore unhelpful.

Together is best
What does “together” actually mean? If the whole team is based in the same office, they certainly had lots of opportunities to be “together” in the same physical space. The opportunities are there, but are they taken advantage of, bearing in mind the following:

• people may be in the office at the same time but don’t interact with each other much of the time
• people may be in the office at the same time but may not see each other very often (or may actively avoid each other!)
• people may be in the office at the same time but may not need anything from each other, therefore do not communicate
• people may be in the office at the same time but may not co-operate with each other, like each other, share information, or support each other

Under any of those circumstances, people are barely “together”. It is only when there is a need for people to work together (some reliance

5. Measuring the benefits of agile teams:
Researchers have used a wide range of key performance indicators (KPI) to measure the benefits of virtual teams and both the objective (hard) as well as subjective (soft) outcome measures. However, determining the benefits of virtual teams in general is difficult, since this depends on what is regarded as ‘benefit’ by an individual organisation. In addition, the assumption that virtual teams yield benefits is not always valid. Although there are obvious benefits to virtual working for a company, such as the reduction of office space required, some studies have indicated that the effect of virtual teams on productivity, performance and creativity tends to be negative, particularly when insufficient attention has been paid to the things that need to be done differently for teams to thrive when working apart from each other.
upon each other in order to achieve desired ends) and some agreed methods of working / interacting that they will actually be effective, even though they are based in the same place, with lots of opportunities to interact and work to achieve their shared objectives.

There is no doubt that for some situations or for particular outcomes, a period of instant access, high face-to-face collaboration would be an excellent route to specific outcomes for particular teams / individuals. It is not a panacea, however. For everyone else, effectiveness will require some element of these conditions, at times when they are most likely to deliver value. The trick is knowing when that situation occurs and how to deliver the effectiveness of the conditions for the period required. Hence the research featured in this Report will be of value for any team, virtual or not – as arguably those who are most “virtual” in terms of their ability to work together effectively, might be those that are based in the office together!

The conclusion is that there is no one size to fit all teams and managers. Teams need to be able to recognise what they require from each other and create effective working conditions no matter where they are based or find themselves operating on a day to day basis.

**Synchronicity**
In the 21st Century, the ability to work and conduct business across time zones, to service customers and partners during their hours of operation rather than our own, to collaborate with parties who aren’t physically with us and to embrace people’s choices of when and where to work, are increasingly vital for success.

To be successful in all manner of roles or businesses, the ability to operate without direct / immediate communication has become increasingly important, without this becoming a skill set that anyone has set out to teach people – or that they consciously recognise as a situation which impacts their ability to do their job without putting something in place to help them.

Clearly there are many situations where asynchronous working occurs, meaning that “real time” communication opportunities reduce in volume and frequency:

a) colleagues are based in different time zones, so need to rely on written communication methods which inevitably mean there is a delay in obtaining information, feedback, decisions, inputs etc.

b) colleagues operate in the same time zone but work different hours or days of the week (job share, part time working, compressed hours, flextime, term time working, etc.) – leading to fewer opportunities for direct face-to-face or voice contact and more reliance on written communications.

c) colleagues participate in more activities away from the team’s base so are less available for 1:1 real time communications and again rely more on written communications.

d) colleagues choose working hours that suit their personal circumstances or when they are most effective, decreasing the amount of time they are available to each other

e) colleagues participate in different team engagements such as meetings or other work related collaborative sessions, such that their communication becomes fragmented due to them receiving different levels of cohesive interactions. This may occur due to workload demands, illness, holidays, or prioritising other activities above those relating to the team.

Naturally, all of these could be addressed
by some time shifting by one or other party in order to make real time communications possible. The impact is on the efficiency of each party to complete their tasks after the engagement has taken place. It is affected by workload pressures and priorities as well as the relationship between the parties and how important the completion of the task is to both parties.

For these more disjointed communications to be effective, a number of things need to be in place:

• People trust that the communications will occur in a timely manner
• They trust that the content will be reliable and comprehensive (i.e. that everything they have raised will be responded to)
• They know each other well enough to know where they can get the things they need (i.e. who know what) – which avoids time wasting for both parties
• They respect each other's time
• They know enough about each other's workload and contributions to make a judgement about whether that input will be satisfactory

When teams work asynchronously, they rely more heavily upon written communications and upon the quality of those communications. Written communications such as email (and to a degree instant messages and text messages) need to be clear and unambiguous so that time isn’t wasted through misunderstandings or incomplete responses. A few word response to a detailed email is worse than useless unless those words cover everything that the originator asked the sender to respond to. The quality of the written communications are also important – and the extent to which they convey anything other than the content requested will have an impact upon the relationships between the parties.

The degree to which this is important will be affected by the strength of the existing team relationships, how well they know each other, how much they know about each other’s communication preferences, how vital the information is that flows between them in written form, as opposed to spoken or face-to-face.

The important thing is that when these sorts of things happen, teams should take steps to identify if the lack of real time interactions is having an adverse effect on the team and if so, to generate more opportunities for those real time communications to take place. This may require some alteration to priorities, adjusting workloads, moving some people’s working windows so they overlap more, or changing some working practices for a temporary period in order to get things back on track. For example, some team members may favour written communication because this method allows them to respond when they have time. However, if their written style is poor, this may cause others an increased workload through uncertainty, lack of clarity or misunderstanding.

Conclusion
The steps that can be taken to address these issues are the subject of later sections of this Report. The important conclusion to be drawn at this stage is that as the natural opportunities for real time communication (spoken or face-to-face) decrease, the importance of written communications increases. Poor written communications can be resolved by a quick chat, but if there are few opportunities for that quick chat, then a misunderstanding may take a while to be unearthed. Reliance on written communication also calls (ideally) for the rigour with which the team members communicate (frequency, speed of response, clarity of
In conducting the research into virtual team management strategies, it became clear that aspects that the Research Group had looked into when researching knowledge work team productivity lay at the heart of virtual team performance as well. The important conclusion is that if these factors are important for all teams, then the ways in which they impact performance could be expected to be different where the team spends much time apart and communicating largely through more remote means. This Section looks at six factors impacting team performance and the ways in which they come under pressure the more the team works remotely or virtually.

Another aspect of the knowledge work research was that it highlighted that knowledge work is a continuum – there is no easy distinction between knowledge work and say ‘manual work’ because to varying degrees knowledge is used in all forms of work. It is helpful to explore this in a little detail before considering the six factors of team performance, as they set things in context.

Knowledge work – the importance of process / prescription / complexity

When considering the efficiency of a team’s activities, six factors are known to be critical (see below). In determining the degree to which these factors are important to any particular team, it became necessary to consider the nature of the work the team is in business to produce and the means by which their “output” is generated.

Drawing on research by Ramirez & Steudel in 2008 a number of aspects were identified, that enabled an understanding of the nature of a team’s work. These are:

- **Autonomy** – the degree of freedom the team members have in deciding when the tasks are performed
- **Structure** – the degree to which the tasks are predetermined / prescribed
- **Knowledge** – the degree to which job holders make use of their knowledge and experience in order to apply skills in doing their work
- **Creativity and innovation** - the degree to which team members use creativity to do their jobs
- **Complexity** – the degree to which the tasks of the job are complex or easy to understand
- **Routine and repetitiveness** – the degree to which the job tasks are routine and repetitive – i.e. whether they are the same or different each day.

It can be seen that there is a scale implied by these dimensions – from easy, repetitive, prescribed tasks where little creativity or complexity exists, through to tasks / activities where there is innovation every day, complex solutions are designed and there is little by way of predetermination, so job holders have wide autonomy to create and generate new ideas, solutions and outcomes.

The Six Factors connected to knowledge work team performance

For any team that is reliant upon knowledge work beyond even a low level – and where the team members truly work together and rely on each other in pursuit of their objectives – the following factors are important to understand and to maintain to ensure team performance:
1. **Social Cohesion** is a shared liking or team attraction that includes bonds of friendship, caring, closeness, and enjoyment of each other’s company. This is usually perceived as a positive experience that binds teams together and as such seems to be strongly associated with team performance. This in turn encourages innovation and judicious risk taking within the team.

*For those that work virtually,* building and maintaining social cohesion is just as important as for co-located teams – if not more so. The ways in which cohesion is built and maintained needs to be more planned and coordinated in the absence of the more opportunistic nature enjoyed by teams who tend to be in the office most of the time. As the degree of virtuality increases, and if more members of the team work asynchronously, then arguably more needs to be done in order to ensure the cohesion is maintained and doesn’t degrade through more of a reliance on written communication rather than verbal or face-to-face. With fewer opportunities to interact, members have fewer inputs through which to understand how their colleagues are, and their friendship, caring and closeness therefore need to be maintained via other means.

For new teams that work virtually, it would be desirable to ensure they can spend some time together in the early stages of forming and getting to know each other – or if that is physically impossible, that alternate means of remote real time communication (video conference, phone calls) are arranged with a specific purpose of generating team bonding and “getting to know you”.

2. **Perceived supervisory support** relates to how supervisor-team member interactions are shaped by perceptions and an underpinning ‘psychological contract’ (of exchanged beliefs and mutual promises) which positively impacts team performance. The predictive nature of the promises made and delivery within a psychological contract can help to build a positive emotional climate, although a breach of promises may damage and even irreparably break relationships.

*For those that work virtually,* ensuring that promises and commitments remain intact is a key focus – and finding ways to do this when members spend time apart is crucial. Replacing the opportunities for team members and supervisors to deliver on their mutual promises when they are apart is more challenging, but certainly not impossible. Having recognised that these demonstrations of support are important, they can be built into the remote communications between the parties. The maintenance of a positive emotional climate requires attention to be paid to the quality of communications (particularly written ones).
because what is appropriate shorthand between parties that are communicating face-to-face often does not transfer easily into other forms of communication. The lack of any visual cues and the opportunity for immediate clarification or reinforcement means that team members need to take more care with their written communications – for fear of misunderstanding, misinterpretation and offence.

3. Information Sharing refers to how teams pool and access their knowledge and expertise – which positively affects decision making and team processes. This has led to the idea of a team ‘Transactive Memory System’ (TMS), which can be thought of as a collective memory in a collective mind - enabling a team to think and act together. Having close relationships and frequent social interactions about team knowledge and expertise facilitates the development of the TMS.

For those that work virtually, the maintenance of the knowledge about “who knows what” could be more difficult to secure, unless some mechanism is put into place to ensure that the future development of knowledge and expertise continues to be shared with team members and is easily accessible. Building this into team meetings, ensuring knowledge is visible (using online tools such as Yammer, asking people to “show and tell” when they do get together etc.) and embedding the sharing into team protocols and objectives are critical to ensure this aspect of team performance survives when people work remotely.

Particularly important for newly formed teams is the information about each other that is normally built over time. Establishing knowledge directories or skills inventories not only provides worthwhile information but helps to build trust in the competence of colleagues. Specifically assigning team members to work on small subtasks helps initial bonding which can be shared with others.

4. Vision and Goal clarity set future direction. They also express organisational values about what is important through shared goals and enhance the performance of organisations and teams. When applied to teams, a vision includes having common goals that a team is committed to (usually through their active involvement) and work best when organisational and team visions align and are clearly expressed.

For those that work virtually, clarity about team goals are even more important. There are fewer opportunities to reinforce the goals through informal discussions or team interactions. Reinforcing goals during meetings and 1:1 sessions becomes more important, as is monitoring the inputs and behaviours of team members which may indicate they are off-message. If virtual team members are part of more than one team, their efforts will naturally gravitate to the work that most interests them, or from which they derive most benefit. Hence monitoring is vital to see where team member connection to the goals might have slipped.

The use of agenda and meeting outcome statements help people stay focused and connects their efforts to the team goals. When working apart it is easy for individuals to be more connected to their personal goals, to the detriment of the team goals.

5. External communication refers to the ability of teams to span boundaries (team
and organisational) to seek information and resources from others, which has a positive impact on team performance. While internal communication was found through research to be particularly important to team innovation, external communication was strongly associated with the team performance. This seems particularly important for knowledge worker teams.

External communication enables organisations to anticipate future trends and invest in ideas and solutions that may gain them competitive advantage.

For those that work virtually, their visibility to each other and to those outside the team is vital, to develop networks, secure fresh ideas and ensure they are not forgotten or overlooked. When working apart, it is important that the impact of the external communication activities is visible to team colleagues, so they can appreciate its impact and effect.

It is also important to ensure their successes are known to influential management in the business, keeping them in the corporate spotlight and ensuring they aren't forgotten at reward time. This helps to counteract natural bias caused by lack of visibility. Without sufficient acknowledgement and reward, people will gravitate back to a more presence-focused way of working – defeating all the positive benefits of working virtually.

When working virtually, teams should ensure that these efforts are visible to team members, so their efforts are co-ordinated.

6. Trust is a firm belief in the reliability, truth or ability of others. It is created by the expectation that the actions of the other person(s) will be to one's benefit or at least not detrimental to him or her. This is important between team members and colleagues (horizontal trust) but also requires vertical trust (managers or others in vertical reporting lines) to positively enhance team performance. It also ensures that organisational and team goals and interests align.

Transparent procedural justice (fairness) in the operation of organisation policies and procedures is also essential. Moreover, supervisor and team competence combined with empathy are important to establish and grow trust. A breach of trust can create distress and is even harder to rebuild than it is to build. Without trust, negative behaviours tend to drive a downward spiral of performance.

For those that work virtually, trust tends to be based on actions rather than goodwill (the latter being harder to determine and observe from a distance). Therefore the degree to which people do what others expect them to do becomes a key measure of how much they are trusted and can be relied upon.

Agreeing norms or procedures explicitly therefore sets the expectations against which people will determine whether others “deliver” and leaves less to chance, personal interpretation or personal practices. It can also avoid many misunderstandings, which can often breach trust, and ensure that everyone can be drawn back to the original agreement if things drift off track.
GETTING IN TUNE WITH ASYNCHRONOUS WORKING

The research review has indicated a number of elements that are important for the success of virtual teams – both from a management perspective as well as the composition of the team itself. While the focus of the research was to identify management practices, it has become clear that this is only part of the picture – and that the way to success is for every member of the team to be a critical cog in the wheel, demonstrating the right behaviours, committing to shared practices, demonstrating leadership qualities that recognise that working virtually is different and requires a different approach.

This section of the Report goes into some detail of the areas found to be most important, and provides some examples and ideas for how these elements can be better understood, measured and operationalised.

The elements covered in this section are:

<table>
<thead>
<tr>
<th>Management / leadership style</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality</td>
<td>21</td>
</tr>
<tr>
<td>Contextual factors:</td>
<td></td>
</tr>
<tr>
<td>Task co-ordination</td>
<td>25</td>
</tr>
<tr>
<td>Cohesion</td>
<td>27</td>
</tr>
<tr>
<td>Communication richness</td>
<td>29</td>
</tr>
<tr>
<td>Trust</td>
<td>32</td>
</tr>
<tr>
<td>Work relationships</td>
<td>36</td>
</tr>
<tr>
<td>Cognitive bias</td>
<td>38</td>
</tr>
</tbody>
</table>

Management / leadership style

The difference between a manager and a leader is far from clear. As a result the concept of “manager” and “leader” are subject to numerous definitions. Although it is clear that a person can be a leader without being a manager, just as a person can be a manager without being a leader (some “managers” have no direct reports), most scholars agree that there is a large degree of overlap. In both roles, a substantial part of time is spent “influencing employees to understand and agree about what needs to be done and how it can be done effectively, and facilitating employees to accomplish the shared objectives” (Yukl, 2002). Accepting this common ground, then management/leadership style (for ease of reading, we will use the term “leadership style” to cover both styles, and the term “leaders” to cover managers/leaders) is the way in which this process of influencing and facilitating is carried out. Leadership style does not only refer to the style of a single leader, but can also pertain to the overall leadership style of an organisation. In case of the latter, it is part of the broader notion of “corporate culture”.

What kinds of leadership styles are there?

One of the first studies on leadership style was conducted in 1939 by Kurt Lewin. In this early study, schoolchildren were assigned to one of three groups whose leaders each used a different leadership style. When Lewin and his colleagues observed the behaviour of the children in response to the different styles of leadership, they identified three different styles:

- authoritarian or autocratic – telling employees what to do and how to do it, without listening to their advice
- participative or democratic – involving employees in the decision-making process, but maintaining the final decision-making authority
• delegative or laissez-fair – allowing employees to make the decisions, but maintaining responsibility for the decisions that are made.

Since Lewin’s identification of these three leadership styles, numerous studies have been conducted on this subject, and, as a result, many different leadership styles have been discussed in both academic and popular literature. A landmark date for this area of study was 1978, when James MacGregor Burns, an American historian and political scientist, introduced two contrasting styles of leadership: transactional and transformational.

Transactional leadership is based on exchanges between a leader and his/her employees, with rewards and punishments as key motivators. Transactional leaders focus attention on the achievement of agreed standards, and will intervene when mistakes and deviations occur in performance. In contrast, transformational leadership is based on the creation of a shared vision that employees are encouraged and empowered to pursue. Leaders who favour this style focus on the organisation’s higher-order goals and look “for potential motives in followers, seek to satisfy higher needs, and engage the full person of the follower” (Burns, 1978).

The concept of transactional versus transformational leadership styles has resulted in more than 1,000 empirical studies in peer-reviewed journals. Since the publication in 1978 of Burns’ findings, many comparable leadership styles have been introduced (such as task versus people-oriented, for example), but Burns’ theory on leadership style is still the one that is based on the best available evidence.

**Association with team performance**

Over the last 50 years, there have been a considerable number of studies on the relationship between leadership style and performance. Several meta-analyses have indicated that although both transformational and transactional leadership are positively associated with team performance, the relationship between transformational leadership and performance is stronger (Bass, 1990; Lowe & Kroeck, 1996).

However, in the case of virtual teams, research indicates that performance only improves when there is a good match between leadership style, degree of virtuality, and aspired goals. For instance, randomised controlled studies with MBA students have showed that a transactional leadership style improves the quantitative performance of a virtual team, whereas a transformational leadership style enhances creativity and qualitative performance (Huang, 2010; Kahai, 2012, Kai Tang, 2014).

In addition, it was found that transformational leadership has a stronger effect on virtual teams using only computer-mediated communication, and that leaders who increase their transformational leadership behaviours such as role modelling, setting people challenges, inspiring people to identify with a shared vision, listening to their concerns and interacting with them as individuals) in such set-ups achieve higher levels of team performance (Purvanova, 2009; Hoch, 2014). This supports the idea that leadership style can compensate for the negative effects of virtuality.
How does leadership affect the performance of virtual teams?
In general, it has been widely shown and argued that when a transformational/people-oriented/participative style of leadership is applied, employees feel trusted and appreciated, and in return they feel loyalty and respect for the organisation and its management. The underlying mechanism behind transformational leadership is based on a leader's capacity to motivate employees, make them aware of the consequences of their tasks, and help them to align their personal goals and needs with those of the organisation, and thus motivate them to perform beyond expectations. However, it has also been shown that more explicit managerial guidance, goal setting, and closer control of employee behaviour, as is the case when a transactional leadership style is applied, has a positive effect on quantitative performance (i.e. the number of correctly completed activities), especially on short-duration tasks (Michaels et al, 1988, Jung, 2001).

In the context of a virtual team, however, when there is a limited level of face-to-face contact and team interaction, researchers have found support for the mediating role of trust in the link between leadership style and performance. Trust is found to be crucial for the performance of virtual teams because it influences whether individual team members are willing to share and exchange information and knowledge with each other. Transformational leaders increase trust by empowering and encouraging employees, expressing concern for their needs, honouring agreements, and creating a shared group vision. Thus, a transformational leadership style has both direct and indirect effects on performance, whereas a transactional leadership style has only a direct effect on performance (and then only if the output is of a quantitative nature).

How do you measure leadership style?
Leadership style can be measured with the Multifactor Leadership Questionnaire (MLQ) developed by Bass and Avolio (1995) (see Appendix 1 – Questionnaires). The Multifactor Leadership Questionnaire is a well-established instrument in the measure of Transformational Leadership as well as being extensively researched and validated. It allows leaders to measure how they perceive themselves with regard to specific leadership behaviours, but the heart of the MLQ comes from feedback from employees.

Practical things to do
There are a number of aspects to aligning leadership practices to the type of tasks and outcomes that the team is in business to perform. Understanding the style of the leader would appear to be a good first step, using a tool such as the MLQ. To ensure success in the virtual team, the following activities are (with reference to work by Malhotra et al (2007) particularly effective:

- **understanding** the skills and personalities that will deliver the best outcome (linked to the clearly stated vision and task objectives for each role of the team) – and selecting the right members that embody those skills and outlooks (where this is possible). Where it is not possible to include the best skills and personalities, at least do so with “eyes wide open” as to the likely challenges and what could be done to mitigate them, is preferable.
- **establishing appropriate norms of behaviour** – explicitly and through engaging with the team to encourage buy in and a shared vision as to what this will deliver. Norms / rules can help guide team members about what is expected, leaving less to chance. Explicit agreements as to who will do what / when sets expectations...
and enables all team members to quickly form views as to the trustworthiness and reliability of others.

- encouraging participation in social events to build relationships and foster trust where this is possible. Face-to-face is the ideal scenario, but if this is not possible, then virtual social events can be arranged (on-line tea party where everyone joins a session armed with tea and cake and the discussion is informal, sharing experiences with the purpose of getting to know each other).

- set up the structures and processes that will support the team's work and recognise the virtuality and asynchronicity of the way the team will work – i.e. agree times when people will be available; how quickly members will respond to requests for information; participation in face-to-face activities; preferences for different media; meeting preparation and protocols; storage of “in progress documentation”; making progress visible to all team members and to senior management where appropriate. Establishing a “rhythm” to asynchronous working pays dividends, as it ensures that the working day/week does not feel without structure.

- role model the behaviours sought from team members, actively encouraging, recognising and rewarding the demonstration of these behaviours. While the manager is the primary focus for the modelling of behaviours, establishing a shared responsibility with the team sends the message that this is not a one way demonstration. If members do not embody the behaviours expected, there should be a shared responsibility to address the shortfall through peer pressure, mutual coaching and discussion of impacts.

- recognise the importance of trust to the operation of a virtual team and foster its growth through a variety of approaches, engagements and activities (see Section on Trust for more)

- recognising the unique challenges that working virtually delivers to the team – openly discussing how these can be highlighted, shared and tackled. When working virtually, it is very easy for dissatisfaction to fester (unseen). In a trusting team, these should have an avenue to be raised in a non-judgemental way. The leader and other team members’ skills in dealing with conflict are also critical here.

- recognising contributions made by the team and individual team members (particularly the unique knowledge of each person) – it is easy for virtual teams to lose sight of each other and the contributions their work makes to the overall success of the team. Overtly celebrating success and rewarding effort is an important aspect often overlooked in virtual teams (whereas in the office, it is much easier to spontaneously thank people when we see them). Going out of our way to acknowledge and thank people is important.

These elements are set in the context of the leader’s style and its appropriateness to the task and the team. Understanding one’s own style is a good starting point.

**Personality**

The concept of “personal characteristics” includes both demographic factors (such as gender, race, age, and education level), and employees’ personality. To date, less is known on the relationship between demographic factors and team performance. The most consistent and reliable scientific results were found between personality and team performance.
What is personality?
In laymen’s terms “personality” refers to the unique, typical properties of a person. A large amount of complex information on a person is reduced to a limited number of properties, in order to make the complex reality more manageable and predictable (De Fruyt & Mervielde, 2003). Among researchers, there is a wide consensus that the best way to describe personality is by using the “Big Five” personality traits and their underlying Five-Factor Model (cf. Costa & McCrae, 1992). The validity of the Big Five factors has been replicated numerous times in different languages and cultural contexts (cf. Schacter, Gilbert & Wegner, 2011) and the factors and their constituent traits are often summarised as follows (adapted from McCrae & Costa, 1987):

- **Openness to experience:** (inventive/curious vs. consistent/cautious). Appreciation of art, emotion, adventure, unusual ideas, curiosity, and variety of experience. Openness reflects the degree of intellectual curiosity, creativity, and a preference for novelty and variety a person has. It is also described as the extent to which a person is imaginative or independent, and depicts a personal preference for a variety of activities over a strict routine.

- **Conscientiousness:** (efficient/organised vs. easy-going/careless). A tendency to be organised and dependable, show self-discipline, act dutifully, aim for achievement, and prefer planned rather than spontaneous behaviour.

- **Extraversion:** (outgoing/energetic vs. solitary/reserved). Energy, positive emotions, assertiveness, responsiveness, sociability, self-confidence, and the tendency to seek stimulation in the company of others, and talkativeness.

- **Agreeableness:** (friendly/compassionate vs. analytical/detached). A tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others. It is also a measure of one’s trusting and helpful nature, and whether a person is generally well tempered or not.

- **Neuroticism:** (sensitive/nervous vs. secure/confident). The tendency to experience unpleasant emotions easily, such as anger, anxiety, depression and vulnerability. Neuroticism also refers to the degree of emotional stability and impulse control.

These five personality dimensions predict stress response (McCrae and Costa, 1986) and occupational interests (Costa et al., 1984), as well as job performance (Barrick and Mount, 1991), salary levels (Seibert and Kraimer, 2001), life and career satisfaction (Deneve and Cooper, 1998; Judge et al., 1999), job training performance (Barrick and Mount, 1991), sustained attention and perceived workload (Kirkman et al., 2002), and self-efficacy in self-managed work groups (Levitt et al., 1999).

More recent developments on personality are the inclusion of “the dark triad” – Machiavellianism, narcissism, and psychopathy (Paulhus & Williams, 2002) – and the HEXACO model (cf. Ashton et al., 2004), which suggests the inclusion of honesty-humility (sincerity, fairness, greed avoidance, modesty) as a sixth personality dimension.
Associations with agile (virtual) teams
Conscientiousness, agreeableness and extraversion are positively related to the performance of virtual teams, both in terms of outcome and in terms of process satisfaction (Furumo, de Pillis & Green, 2009). Conscientiousness is both directly and indirectly (via “trust” as a mediating construct, see below) related to satisfaction. Agreeableness and extraversion are related to “trust”, which in turn is related to outcome and process satisfaction. In order to maximise the trust levels, virtual teams should be comprised of members who are high in agreeableness, conscientiousness and extraversion.

As working in virtual teams is also inevitably connected to telecommuting or teleworking, attitudes towards telecommuting are also important with regard to the productivity of virtual teams (cf. Neufeld & Fang, 2005). If we work with people that fundamentally dislike being apart or regard it as ineffective or in some way unapproved, this could prove to be a barrier to effective communication.

Most studies describe individual personality factors. Teams, however, are formed of many individuals, all with different personalities and it is clear that some aspects (such as positive views towards virtual working) are important in teams working virtually. If members of a virtual team display different levels of conscientiousness, this may have a negative impact on the team’s performance as the more conscientious members resent those that put in less effort and/or are less disciplined – sometimes leading to a withdrawal of effort on behalf of the more highly conscientious. The asynchronous nature of virtual team working can also mean that there are fewer cues to determine the amount of effort that colleagues are exerting, leading to some misunderstandings, particularly if communication is poor.

The degree to which conscientiousness variance impacts team performance can be lessened if the team contains different levels of extraversion among its members (Turel & Zhang, 2010). The research on self-managed teams showed that virtual teams need a mix of extraverts (who will tend to take control and assign tasks) and introverts who will naturally pick up and follow the lead of the stronger personalities. Too many extraverts and there may be conflict; too many introverts and there is likely to be a reluctance of anyone to step forward to lead the team’s efforts.

Why does personality influence performance of agile (virtual) teams?
The underlying mechanism or explanation of the relationship between personality and virtual team performance in several of the above mentioned studies is “trust”. Trust has been defined as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (Mayer et al., 1995). Trust predicts innovation (Clegg et al., 2002) and performance (Dirks, 2000).

Trust is important in teams on a financial level, because the transaction costs in teams are lower when trust is high. The individuals who trust each other feel less compelled to monitor or double-check the work completed by others (Furumo, de Pillis & Green, 2009).

Apart from the above-mentioned relations between trust and the Big Five personality dimensions, trust is also directly influenced by an individual’s propensity to trust others.
Extraversion and agreeableness are personality factors that are positively related to a propensity to trust others. Conscientiousness is negatively related to a propensity to trust others (Jacques et al., 2009). An individual’s propensity to trust others is in turn influenced by his/her personality. As such, personality plays an important role as a mediator in the relationship between propensity to trust, actual trust, and the performance of virtual teams (Chen, 2011). This is important, as an individual is very likely to rely on his/her propensity to trust others at the outset of forming a virtual learning team (Chen, 2011).

How can you measure personality?
Personality dimensions are, in research, most often measured with the Revised NEO Personality Inventory (NEO PI-R) developed by Paul Costa and Robert McCrae. With 240 questions, this is an elaborate instrument, providing detailed information on the big five dimensions and subordinate dimensions of each of the main personality factors. A shortened version, the NEO Five-Factor Inventory, uses 60 items (12 items per domain).

The HEXACO model of personality uses 100-items - HEXACO-PI-R (Lee & Ashton, 2004) and the 60 item HEXACO-60 (Ashton & Lee, 2009). The full questionnaires are available (in multiple languages) at http://hexaco.org.

Other measurements of personality, such as the Myers-Briggs Type Indicator (MBTI) are widely used, but their stability, validity, and reliability are questionable at best.

Practical things to do

Team design
Clearly the ability to choose the people that work in a virtual team will vary depending upon the level of control that exists over the allocation of resources. Forming a new virtual team may present many more opportunities to secure the best mix of personality types, the people that may already know each other and have existing bonds of friendship etc. What is clear is that the mix of members within any team has an impact upon its success – so having some appreciation of personality traits and preferences is a natural starting point. Secondly, having identified the traits and preferences, it is critical to understand the impact that this is likely to have on performance if, for example there is a high variation in conscientiousness and/or extraversion within the team (or proposed team).

According to (Turel & Zhang, 2010), managers should assign individuals with similar conscientiousness scores and a variety of extraversion scores to virtual teams to give the best mix for team performance. This would ensure that there are sufficient leaders and followers within the team, and minimise the conflict through different levels of conscientiousness, which can be exacerbated by the lack of visibility of people working virtually.

Gillam & Oppenheim (2006) found that team design is highly important and list the following aspects:

- Build the team around the purpose to allow the inclusion of experts
- Create a team identity
- Have a statement of purpose based on clear understanding of aims, objectives and expectations. Keep focused on maintaining this.
- Identify milestones and acknowledge progress against them
- Ensure training and education are available to develop management and decision-making skills
• Reward small wins and involve all team members
• Ensure members are connected to each other and have appropriate means to communicate – including access to key information, scheduling, planning and synchronising
• Encourage connectivity between team members and strive to develop trust

By sharing the accountability and responsibility for the above, no single person controls them – they are not simply the responsibility of the manager/leader – a key aspect of more self-managing virtual teams.

**Task co-ordination**

A generally accepted definition of co-ordination does not exist, so numerous definitions are available. Singh (1989), states that co-ordination refers to the “integration and harmonious adjustment of individual work efforts toward the accomplishment of a larger goal”. Holt (1988) gives a more poetic view by defining co-ordination as the “dynamic glue that binds tasks together into larger, meaningful wholes”. More recently, Lin et al (2008) defined co-ordination as “the degree of effort between the team members to manage collective resources and the extent to which the work activities of team members are logically consistent and coherent”.

**Why is co-ordination of tasks particularly important for virtual teams?**

Tasks undertaken by members of a virtual team should be assigned and sequenced in order to accomplish that team’s goals and objectives – an activity often performed by managers or team leaders. For virtual teams, the dependence on computer-mediated communication and the psychological and physical distance between team members may prevent the manager from effectively exercising his/her leadership and influence. As a result the co-ordination of the team’s tasks may be less efficient. In addition, time differences may have a negative impact on the co-ordination of tasks within a virtual team, because of the challenge of communicating with each other at the same time (Armstrong & Cole, 2002). Finally, a high degree of virtuality may interrupt team members’ awareness of each other’s work activities, which is essential for an efficient co-ordination of tasks (Kraut et al., 2002). After all, when team members are co-located, they can more easily monitor the status of their colleagues’ work activities.

**Association with the performance of virtual teams**

Research on virtual teams has demonstrated strong links between task co-ordination and performance. A recent meta-analysis based on 18 studies with a combined sample size of more than 4,000 employees found that of all factors such as communication, trust, relationship building, and cohesion, the co-ordination of
tasks seems to have the strongest association with performance (Lin et al, 2008). According to this study, co-ordination seems to be an important mediator for all other factors. A visual model of the relationship between all of the factors is provided below.

**What enhances the level of task co-ordination?**

As is visualised in the model above, social factors such as trust, relationship building, communication, and cohesion significantly contribute to task co-ordination, which in turn has a direct positive effect on the performance of a virtual team. It can therefore be concluded that developing successful social relationships among team members and between team members and management is a prerequisite to effective task co-ordination. If there is a lack of trust, poor cohesion, a lack of good relationships and bad communication – these will deliver poor co-ordination and hence performance will suffer.

Clearly the degree of virtuality has important implications for the dynamics, communication, and social interaction of teams. As a consequence, social factors such as trust, relationship building, communication, and cohesion are harder to develop in virtual teams, which has implications for the way in which teams are formed (i.e. drawing upon people who already know each other and have those relationships formed already, where possible). For existing virtual teams where these factors are not in place, specific actions need to be taken in order to develop the aspects that are known to be important.

**Practical things to do**

**Huddles**

Many successful co-located teams have a daily “huddle” session, where everyone gets together early in the day to discuss the key focus for the day, to share tasks, challenges and exchange information. It’s a chance to connect, to share and communicate with everyone present. Virtual teams can do this too. There are electronic tools (i.e. GoTo Meeting) when everyone can connect for a quick session where they can review, for example:

- what tasks were completed the day before
- the tasks scheduled to be completed today
- any issues that need to be addressed
- any specific activities that could be identified where people can collaborate further

Such sessions can use just voice, or voice and video (which enable people to see each other and assess how they think everyone is). Good facilitation of the huddle will ensure everyone contributes (very important) and that it is participative, not just a download from the manager “telling” everyone what to do! Keeping the format consistent (or only changing it after due consideration) will help everyone know what to expect and to keep to time.

By identifying opportunities for people to work together, this will help strengthen team bonds and trust through collaborating more closely and learning more about each other’s strengths.

**Establish agreed working practices**

It is clear that when teams are co-located, the norms and rules of behaviour seem to be more obvious, even though they are often unstated. When people are working closely together, there is more opportunity for people to correct each other, provide guidance by demonstration and for group norms to emerge.

For those that work virtually, it is more important to identify and agree the rules / norms so there are fewer opportunities for things to go awry – as otherwise the means of correction takes longer to deliver and people form poor practices and behaviours, at least in terms of the greater team good.
It has been suggested that rules can take the place of implicit trust, and that adherence to the rules can be a test by which trustworthiness can be explicitly expressed. This may be an approach for teams already experiencing trust issues, and ensuring everyone contributes to drawing up the rules / norms would help people buy into them.

The following rules are suggested by Walther (2005), and were used in a university setting, but seem to have good applicability for the workplace:

**Rule 1** Get started right away – it is more difficult to establish rules in a virtual team, so the sooner they are in place, the more they are able to mitigate the inevitable loss of time / progress which occurs as a consequence of using computer-mediated communication.

**Rule 2** Communicate frequently – which builds trust (trusting behaviours and perceptions) and also avoids things piling up at particular times or events in the working week/month.

**Rule 3** Multitask getting organised and doing substantive work simultaneously – rather than waiting until everything has been defined and allocated (a typical practice of co-located teams), thus mitigating the impact of asynchronous working patterns.

**Rule 4** Overtly acknowledge that you have read one another’s messages – when together in the office, people hear and absorb things around them, which can’t happen with virtual teams. This can be done by “read” email acknowledgements but only if people have truly absorbed the message. Assuming team members have common knowledge can be dangerous so explicit acknowledgement helps here.

**Rule 5** Be explicit about what you are thinking and doing – to give others the opportunity to know and to respond – expressing either agreement or alternatives. Silence should not be taken as assent!

**Rule 6** Set deadlines and stick to them – this builds trust as there is vulnerability associated with waiting for team members to deliver on tasks. When they do deliver, trust is reinforced and the relationship will strengthen.

These rules were found through Walther’s research to be effective, particularly in the development of trust and the perceived quality of work. It seemed likely that following rules provides some certainty about what is required, leading to trust and liking within the virtual group – the actual rules being followed were perhaps less important. So the important conclusion is that the team should decide upon the rules to be followed.

**Cohesion**

Social cohesion refers to a shared liking of or affection for the team, caring and closeness among team members, and enjoyment of each other's company. Cohesion from a task perspective corresponds to a group's shared commitment to or liking of the group task or goal, as well as motivation to coordinate team efforts to achieve common work-related goals.

A recent meta-analysis (Lin et al 2008) found that social cohesion was critical to the performance of virtual teams and satisfaction among the team members.

**Why Cohesion is important**

Social Cohesion has been demonstrated to have a positive relationship with team performance. The strength of this relationship depends on the organisational setting (Chiocchio & Essiembre 2009) and it seems to
play an important role at the start of a project, and again when the ongoing life of the team becomes established and the need for creativity has diminished. The strength of the relationship between cohesion and performance depends on the type of team, for example it strongly predicts performance in teams with uncertain and complex tasks (e.g. project or R&D teams), and has a higher association with performance in knowledge work teams rather than in production work teams. In knowledge work teams, social cohesion can facilitate their greater need for communication and knowledge.

Association with the performance of virtual teams
High levels of social cohesion create a psychologically safe environment – enabling people to take (judicious) risks and explore new ways of doing things, sharing information and knowledge. The sharing of knowledge and information is critical to any team whose members rely upon each other to complete shared tasks. Where there is more challenge in making that knowledge and information visible, people need to work harder and think through how they will make this happen.

The research conducted by Lin et al emphasised the importance of the social factors in building effective virtual teams. Relationship building and social cohesion have a significant impact on task co-ordination (indeed could be seen as a pre-requisite for it) which in turn influences both performance and team member satisfaction. The social factors are evidently more difficult to develop in virtual teams due to the deficiencies of social cues required to build relationships, even when using video conferencing. There is also a greater tendency to experience higher levels of conflict when there is an over reliance on computer mediated communication methods.

How can we measure social cohesion?
Social Cohesion involves perceptions and feelings, and therefore self-assessments are the most valid method of measurement (as opposed to assessments made by external observers such as managers).

Examples of questions that can be used to measure Social Cohesion are:

1. Members of our team like to spend time together outside of work hours
2. Members of our team get along with each other
3. Members of our team would rather get together as a team than go out on their own
4. Members of our team defend each other from criticism by outsiders
5. Members of our team help each other on the job

If a team has a low score based on these types of questions, managers and teams should look at ways in which to improve the level of cohesion (and hence performance) within the team.

Practical things to do
Cohesion is interconnected to other contextual factors, and hence should be considered alongside those aspects – i.e. personality, trust and work relationships. The following are drawn from the current research and the work conducted for the AWI Research Group on the Productivity of Knowledge Workers:

1. Select the right people for the team – as illustrated elsewhere in the Report with regards to personality and work relationships.
2. It is not always possible to choose team members - so having team members without the requisite interpersonal skills is a very real possibility. Nevertheless, team
diversity is an asset and from an ethical standpoint individual differences should be respected. Providing coaching and feedback designed to develop appropriate skills would be beneficial in these situations.

3. Team bonding helps people to get to know each other better – whether this is done in a social setting or by focusing upon specific exercises or tasks that are designed to enable people to know more about each other's values, contexts, pressures, skills. Assigning specific individuals activities designed to accelerate team bonding will assist people to form more accurate assessments of each other, influencing trust and relationship building.

4. Promoting a safe psychological environment for the team's activities – important for all teams, but essential for a virtual team that has less opportunity for face-to-face interaction. Encouraging input, respecting differences, recognising the impact of each person's emotions upon their teamwork are all important elements. If people feel comfortable, they can freely contribute – so watching out for signs that people are withholding or not contributing is advisable.

5. Developing and deepening relationships through the use of tools such as a team “charter” – particularly if established early in the life of the team. This sets boundaries and guidelines – clarifying what is expected from team members and reinforcing values and objectives.

6. Surfacing and addressing conflict which can more easily arise when working exclusively with low levels of communication richness. Enabling people to address their concerns and frustrations openly within the team clearly requires trust and support from other team members.

Communication richness

Developed by Daft and Lengel in 1986, Media Richness Theory relates to “the ability of information to change understanding within a time interval”. The theory states that all types of media vary in the degree to which they help (or hinder) users to communicate and change understanding – a factor that is defined as their “richness”.

Media that overcome different contextual inequalities and clarify ambiguous messages within a short time frame are therefore considered richer than those that take longer to convey understanding. A rich medium is one that:

- transmits verbal and non-verbal cues
- uses natural language
- allows for immediate feedback
- conveys personal feelings and emotions

All of these help to overcome contextual inequalities (such as those arising due to a lack of appreciation of cultural communication practices in different countries) and clarify ambiguities (Daft and Lengel, 1986). It is important to recognise that face-to-face communication (in person as opposed to using video) may not deliver the “best” experience – people in the same room may still suffer from poor engagement and communication, depending upon the degree of trust between them, their relationships, co-operation etc. However, all other things being equal, it gives the best opportunity for removing the impact of other contextual factors / inequalities which impact other communication media. Communication between team members is an important tool for information processing and can take various forms, which differ in terms of richness:
Virtual teams depend on different media for communication, and, because their team members spend a considerable amount of time apart from each other, the media they use will often be computer-mediated (CMC), such as video conferencing, e-mail, or text messaging.

In addition, media can be categorised by means of the Media Synchronicity Theory (Dennis and Valacich, 1999), which distinguishes between two types of communication: synchronous and asynchronous. Synchronous communication media allow individuals to work simultaneously on the same task, with the same information (face-to-face contact or video conferencing). Asynchronous interaction involves team members communicating at different times, for example by e-mail.

The limitations of media in a virtual environment (e.g. in a virtual team) may limit the quantity and quality of information and therefore the richness of information. More complex tasks or tasks with high interdependencies therefore demand richer or more synchronous forms of communication, so may be more challenging using only methods giving a low level of richness.

Association with the performance of virtual teams

There are several studies that explore the relationship between media richness and the performance of virtual teams. Media richness is found to be one of the contextual factors that have a substantial positive effect on the performance of virtual teams. For instance, a recent meta-analysis demonstrates that there is a significant positive but indirect relationship between communication and team performance (Lin et al, 2008).

Virtual teams may experience limitations in the quantity and quality of the information communicated because the use of a rich medium, such as face-to-face communication, is often not an option. Virtual teams are highly dependent on computer-mediated communication technology, which:

- reduces opportunities for monitoring team members, and makes it more difficult to interpret knowledge and understanding, as the subtleties of the context in which people work may not be known or appreciated (i.e. the use of more explicit, direct language may be unwelcome or even offensive), (Gibson and Gibbs, 2006).
- may hinder understanding and complicate knowledge transfer, especially when the information is ambiguous (Wong and Burton, 2001).
- reduces non-verbal cues that reveal interpersonal affections such as tone, warmth, and attentiveness, which can have a negative effect on both the message clarity and the interpretation of feedback (Kankanhalli et al., 2007).
- changes the patterns of work, decision-making, and understanding of the work as well as the relationships between the individuals involved in the work (Berry & Gregory, 2011).
tends to delay feedback. These delays may result in misunderstandings, causing negative feelings between team members, who may feel they are being ignored (Tan & Wei, 2007).

Further issues concerning CMC include the difficulty of conveying context and the salience of information as well as interpreting silence (Gilliam & Oppenheim, 2006) – as can happen not only with culturally diverse teams, but also with different personality types (e.g. more reflective, introverted thinkers). These, among other difficulties, can potentially lead to ineffective communication, which may be detrimental to the performance of a virtual team.

Although CMC has its limitations, if face-to-face communication is not possible, research shows that CMC improves the co-ordination of virtual teams (Massey et al., 2002). It also enhances the exchange of social cues, which help to build interpersonal relationships between team members in the early development of such a team (Chen et al., 2011; Arbaugh and Benbunan-Fich, 2007; Maznevski, K.M. Chudoba, 2000), as well as helping to foster cohesion among team members (Carron et al., 2000). One study indicated that the difference between communicating through video conferencing rather than directly face-to-face may not lead to significant differences in cohesion (Hambley, 2007).

**How does media richness affect performance?**

In a meta-analysis by Lin et al. (2008), factors determining the performance and satisfaction of virtual teams were described and tested. Communication was deemed to have an indirect effect on performance – it has a strong positive effect on both relationship building and cohesion, which in turn are positively correlated to the co-ordination of tasks. Co-ordination then affects the performance of virtual teams. The social dimensions are thus indirectly important for the performance of virtual teams through their influence on the co-ordination of tasks. Similar mechanisms were found by Huang (2010).

Since research suggests that CMC is a less-rich medium for communication than face-to-face interaction, especially at the outset of establishing a virtual team (Ocker et al, 1999; Hambley et al., 2007), extra emphasis could be placed on improving relationships and cohesion, especially in those crucial early stages, by means of regular face-to-face meetings or video-conference calls (Hambley et al, 2007; Lin et al., 2008).

**How can (perceived) media richness be measured?**

The communication environment can be measured by using the following statements adapted from validated questionnaires by Hambley (2007) and Dennis and Kinney (1998) regarding the perception of team members about their overall communication “environment” – i.e. including all forms of communication that they use:

<table>
<thead>
<tr>
<th>Measuring communication environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The environment in which we communicate helped us to better understand each other</td>
</tr>
<tr>
<td>2. I could easily explain things in this environment.</td>
</tr>
<tr>
<td>3. When we disagreed, our communication environment helped us to come to a common position.</td>
</tr>
<tr>
<td>4. The communication conditions helped us to exchange communications quickly.</td>
</tr>
<tr>
<td>5. There weren't any ideas I couldn't relate to the other party because of the communication conditions.</td>
</tr>
</tbody>
</table>
When the aggregated team score is low, this is a strong indication for low media richness for the task at hand and more investigation can then take place regarding the different types of communication that may work better for the team (or individual team members), thus leading to a better implementation of a suitable mix for the team.

**Practical things to do**
Understanding the implication of the use of different communication methods is a good start for any team. The team members will all have personal preferences, which align to their personalities, the degree to which they are working synchronously or asynchronously from their colleagues and their workload.

Being able to understand the preferences of others enables some discussion and negotiation between members in terms of what will help them work most effectively together – as will some understanding of the impact of one person’s style on another, in a non-judgemental, constructive way (i.e. “when I don’t hear from you I worry that you aren’t doing what I asked you in my email. Can you call me so we can discuss to make sure we’re both on the same page?”)

**Anticipation and flexibility**
Encouraging and motivating team members to anticipate the needs of others and to go the extra mile to provide information; check it has been received; adjust to time zone or working pattern challenges all help to build rapport and trust among team members. This behaviour can be modelled by the manager, but it remains the responsibility of ALL team members to take responsibility for the group (not just personal) activities to ensure a good outcome for the team.

Virtual communications such as video and audio conferences will all benefit from a clear agenda, purpose and outcome for the discussion. Not only will the sessions be more productive, they also help to build trust and relationships if there is an evident shared purpose, objective and respect for the time of others.

**Training and familiarisation**
Not all team members may be fully competent in the use of all communication technologies, leading to reluctance to use them. Basic familiarisation and support helps embed the necessary skills. Agreement as to which media are used for particular tasks also helps build agreement and trust in the team.

**Trust**
Trust refers to a feeling that one can show towards another person or group of people. It is created by the expectation that the actions of the other person or people will be to one’s benefit, or at least not detrimental to him or her (Gambetta, 2008).

By demonstrating trust, one suspends any doubt that someone else’s actions will be based on self-interest (Möllering, 2006). For employees, there are two groups of people within an organisation towards whom they can direct their feelings of trust: their team members and their supervisors. Trust in team members is often called horizontal trust, where employees expect their colleagues to take collective interests into account when making decisions and not only act out of self-interest. For instance, by sharing a new idea with a team member, one is willing to risk the ownership of the idea.

Vertical trust refers to the trust employees have in management, who they expect will take the interests of employees into account when
taking actions. Trust has also been “subdivided” into numerous different factors, although the two generally accepted ones (McAllister, 1995) are “affect-based trust” (when emotional ties between individuals form the basis for those feelings) and cognition-based trust (formed as a result of cognitive reasoning – i.e. based on evidence of another person’s competence, knowledge and reliability). Affect based trust comes from the heart, cognition-based trust comes from the head.

**Association with the performance of teams**

After many decades of research on control as a mechanism of organisational governance, trust has become increasingly recognised as a relevant factor for the performance of teams in general, and virtual teams in particular.

Many positive consequences of trust between team members and trust in management have been identified, such as the acceptance of influence, openness in communication (Zand, 1972), team commitment (Costa, 2003), and cooperation (McAllister, 1995). In addition, there are many studies available that demonstrate a positive relationship between trust and the performance of virtual teams. A recent meta-analysis based on a sample size of more than 1,400 members of virtual teams demonstrates that there is a strong positive relationship between trust and team performance (Lin et al, 2008).

In addition, affective-based trust is highly correlated with the open exchange of information, and the increased tendency to share personal information, sensitive knowledge and ideas, whereas cognitive-based trust tends to lead to improved professional relations and enhanced collaboration on team tasks – all elements that are essential for the performance of virtual teams (McCallister, 1995; Chowdhury, 2005).

Although both types of trust have an effect on knowledge-sharing between teams, cognitive-based trust seems to have a higher impact on complex knowledge-sharing than affect-based trust. So, with virtual teams, for whom knowledge-sharing is critical, the level of cognitive trust may be a better indicator of team effectiveness (Chowdhury, 2005).

**How does trust enhance the level of performance?**

Trust is crucial for the performance of virtual teams because it influences whether individual team members are willing to share and exchange information and knowledge. Having trust in one’s team colleagues causes an employee not only to take his or her own interests into account but also the interests of their team colleagues. In other words, horizontal trust promotes a shared focus on common goals over directedness towards personal interests. Vertical trust helps to align the team’s goals with management goals. For example, if the team lacks trust in management, it is likely that there will be no alignment between the goals of the team and those of management.

**What determines the level of trust in a group or team?**

There is ample evidence that an employee’s decision to build trust (either with team members or with management) is based on his/her assessment of three elements: competence, integrity, and benevolence (Mayer et al, 1995; Clark et al, 2010). Only when these three elements are present, will a person be inclined to trust others. Competence trust refers to whether a team member or supervisor is perceived as having the necessary skills and expertise to successfully undertake a specific task or action. Integrity trust refers to whether a team member or supervisor upholds ethical standards, such as keeping promises.
Benevolence trust refers to whether a team member or supervisor is willing to perform to a greater level than is formally expected, i.e. if he or she is willing to go the extra mile. These three components of trust are highly intercorrelated, which means that trust will not be established when a manager focuses on only one or two of these factors.

Another important factor determining the level of trust is that of procedural justice (Tyler & Degoey, 1996) – the fairness of the procedures used to determine organisational outcomes. For example, the perceived fairness of the organisation’s performance appraisal systems, professional development opportunities, and job security are all elements that determine employees’ perception of procedural justice, which in turn is a major contributor to the creation and erosion of trust (McCauley and Kuhnert, 1992; Korsgaard et al, 1995). Perceptions of procedural justice are known to be important contributors to the creation and erosion of trust.

In addition, trust is directly influenced by an individual’s propensity to trust others, which is dependent on his/her personality. As such, one’s own character plays an important role as a mediator between propensity to trust, actual trust, and the performance of a virtual team (Chen, 2011).

Finally, an important point is that trust begets trust, while distrust begets distrust (March & Olsen, 1975). When a supervisor trusts his/her employees, for example, those employees are more likely to reciprocate that feeling of trust, and vice versa. The same is true for trust among team members.

**How can you measure trust?**
The following 7 items adapted from the Copenhagen Psychosocial Questionnaire (COPSOQ II) can be used to measure horizontal trust and vertical trust. Both types of trust need to be measured separately, as they are different constructs and not necessarily positively related.

<table>
<thead>
<tr>
<th>Horizontal trust</th>
<th>Vertical trust</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Our team members withhold information from each other</td>
<td>1. The management trusts the team to do their work well</td>
</tr>
<tr>
<td>2. Our team members withhold information from the management</td>
<td>2. The team members can trust the information that comes from the management</td>
</tr>
<tr>
<td>3. Our team members in general trust each other</td>
<td>3. The management withhold important information from the team members</td>
</tr>
<tr>
<td>4. Our team members in general trust each other</td>
<td>4. The team members are able to express their views and feelings towards management</td>
</tr>
</tbody>
</table>

When the aggregated team score on one or both measures is low (i.e. horizontal and vertical trust), this is a strong indication for low team performance.

**Practical things to do**
When forming a new virtual team, trust among team members must be built swiftly. However, when team members do not know each other, they don’t have sufficient information about their co-workers to determine whether each person is trustworthy. So a critical phase is the “getting to know you” stage, where they can learn more about each other’s competences and preferences, in order to establish a basis
upon which they can determine initial levels of cognitive-based trust. If they are able to “get to know” colleagues in a face-to-face setting, including some socialising and sharing activities, this can also stimulate some affect based trust. Without this level of interaction, all the team members have to fall back on is their own propensity to trust others, which clearly won’t get them too far, particularly if they happen to have a low level of “propensity to trust”!

Kanawattanachai and Yoo (2002) identify three key areas for managers to pay conscious attention to, in order to achieve high performance:

1. The development of trust among team members. Although there are challenges to developing a high level of social relationships within virtual teams, trust is clearly vital so should be pursued.
2. Providing teams with relevant information on team members skills and capabilities so that cognitive based trust can quickly develop, alongside socialising opportunities which can facilitate affect based trust to develop.
3. Maintaining as well as developing trust in virtual teams – bearing in mind that typical socialisation strategies may help develop trust, but they may be insufficient if conflicts arise within the team. Therefore conflict resolution skills are vital if the trust among team members is not to suffer.

This research also indicated the importance of the transactive memory system to virtual teams. Building an understanding of “who knows what” is vital to a virtual team who may work asynchronously and therefore have little time or ability to establish who within the team holds vital expertise to assist with team tasks.

With regards to team members, an aspect which would seem to be critical is the understanding amongst the team of the role that trust plays in the interactions between them. Rarely is trust spoken about openly within teams – somehow there is an implicit expectation that “we all trust each other”, but the reality is often far from that idealistic vision. Without finger pointing or identifying who trusts whom, it is productive for people to focus on overtly demonstrating trustworthy behaviour during their interactions.

Similarly, the leader should strive to be visible through frequent contact and exchange of information with team members. The visibility of this behaviour allows team members to make judgements about the leader’s trustworthiness and fosters the development and maintenance of trust. While this can be done via any medium, face-to-face communication allows the leader to demonstrate competence and to go into detail more easily – helping to prevent misunderstanding (Colquitt & Salam, 2009).
Work relationships

The most effective work relationships are those that stimulate employees to go beyond what is expected in terms of their job description and expected performance (Graen & Scandura, 1987). However, employees are unlikely to put in additional effort when the work relationship is suboptimal or under strain. They are more likely to put in extra effort because their relationships are good and they trust that their manager and colleagues will reciprocate, and over the long term they will engage in a fair exchange relationship (Locke, 2009). A recent meta-analysis demonstrated that good work relationships are also strongly associated with the performance of virtual teams (Lin et al, 2008).

The work relationship between employees and their managers is closely related to the concept of Leader-Member Exchange, whereas the work relationship between team members is closely related to the concept of Social Cohesion.

What is Leader-Member Exchange (LMX)?
This refers to the work relationship between a manager (leader) and an employee (member) – not between the manager and the team. This is about inter personal relationships – which will differ with each person. LMX theory first emerged in the 1970s and describes how managers develop work relationships with their employees and explains how those relationships can either contribute to growth and performance or hold employees back. Work relationships divide employees into two groups:

- The 'in-group': who work hard and can be counted on to perform extra tasks and to take on additional responsibilities. In return, the manager exchanges personal and positional resources (inside information, attention, extra support and decision-making influence). The quality of the LMX between the manager and the members of this group is high.
- The 'out-group': employees who perform only in accordance with their job description, who may not have far-reaching career goals, and who are less competent than those in the ‘in-group’. This group receives considerably less attention from the manager and has less access to the organisational resources. The quality of the LMX between the manager and the members of this group is low.

Studies have validated the LMX theory in numerous contexts and have shown that good-quality relationships have a strong positive impact on leadership effectiveness.

Association with team performance
A large number of studies, including a recent meta-analysis of 50 studies involving 9,324 subjects, revealed that LMX is positively related to a wide range of outcomes, such as performance, job satisfaction, turnover intentions, level of innovation and organisational commitment (Graen and Uhl-Bien, 1995; Ilies, Nahrgang, & Morgeson, 2007). In addition, research has indicated that LMX quality highly correlates with fewer conflicts or strains in the relationship. (Howat & London, 1980; Keller & Dansereau, 1995). In short, a high level of LMX is an excellent predictor of managers’ performance.

Why is the quality of the LMX particularly important for the management of virtual teams?
There is a strong negative interaction effect between the degree of virtuality (the amount of time that team members are physically
together and the level of media richness in their communications) and the quality of LMX. For instance, the physical dispersion of members and the use of computer-mediated communication often leads to a lower degree of shared knowledge and may cause communication delays, which in turn may lead to misunderstandings and negatively affect the quality of LMX. This also means that when LMX is already low, virtuality makes it lower. LMX hence has a considerable influence on whether a team – and especially a virtual one – is performing to its best ability.

What determines the level of LMX in a virtual team?
The use of computer-mediated communication and the resulting physical and psychological distance have a negative impact on the quality of LMX. Physical distance is the observable gap between two people in space. When the degree of virtuality is high, the number of informal meetings, “water cooler meetings”, social events, etc., that happen for co-located teams will be significantly reduced, or even eliminated. Such informal encounters are known to play an important role in developing an employee’s emotional attachment, which is a prerequisite for good-quality work relationships (Bolino and Turnley, 2009).

Psychological distance refers to the feeling of separation that an individual has in relation to another person (Salzmann and Grasha, 1991). In other words, it is the employee’s perception of feeling close to or far from his/her manager (and vice versa). The more an individual feels he/she has points in common with another person, the greater the feeling of closeness and the less the psychological distance will be (Napier and Ferris, 1993).

Although both types of distance have an effect on LMX, psychological distance and perceived (subjective) physical distance, have a much higher impact on work relationship quality than the objective physical distance.

How can work relationship/LMX quality be measured?
There are several measurement tools available to determine relational quality, but the most appropriate and recommended one is the LMX-7, a seven-item measure developed by Graen and Uhl-Bien (1995).

Practical things to do

Awareness
LMX theory shows that managers must become aware of their attitudes towards their employees. A manager may not like some employees as much as others, but he or she should always try to separate personal feelings from the task at hand, i.e. managing and supporting all members of the team in order to achieve the stated goals.

When a member feels that, compared to other team members, the manager offers little support, less trust, and no additional benefits on top of what is included in the work contract, he or she may perceive this as unequal and unfair, which has a negative effect on both the member’s performance and the manager’s leadership effectiveness. The advice therefore is that managers should avoid the temptation to, consciously or unconsciously, create disparities and strive to bring as many employees as possible within the in-group and thus raise the level of LMX for the whole team.

Developing relationships
Initial 1:1 meetings which are geared to exploring mutual motives, attitudes, benefits and expectations will help establish the most promising people for the “in group” and identify where there are likely to be problems between
manager and employee. Since the objective is to have as many within the “in-group” as possible, both parties need to be focused on taking responsibility for developing the relationship between them. The danger when working apart is that those who present a more difficult working relationship are contacted less frequently, or using different communication media, which arguably will just make things worse and cement patterns of unhelpful behaviour.

For example, if a manager has been let down by a team member, she will be suspicious if her emails go unanswered. In reality the staff member may just feel swamped and overwhelmed. The situation can quickly come to an impasse which only dialogue – prompted by one or other party, can address.

The development of trust, loyalty and respect will help to cement the position of team members within the “in-group” and the desirability of being in it for each member of the team. Doing this virtually requires more effort and planning, as well as making the most of time together. Using virtual get-togethers which are planned and coordinated have been used by successful virtual teams, helping to keep everyone connected and reinforcing the team’s identity (Malhotra et al 2007).

The following tips (Lunenburg 2010) will be useful for managers AND team members – it is important to recognise the dual responsibility here:

• take responsibility for developing and maintaining trust by focusing on the quality and frequency of communication, and delivering on promises and commitments.
• proactively address areas of conflict through constructive problem solving approaches so that membership of the “in-group” is maintained
• stay focused on goals and remain positive about accomplishing them – an unsupportive manager or recalcitrant team member is just another obstacle to be tackled!
• people should empower themselves to get things done
• meet regularly to review motives, attitudes and benefits of the working relationship – which will help establish mutual expectations and understandings.

Cognitive bias

Bias is an inclination or preference that influences human judgment from being balanced or fair. It was long believed that human beings make rational decisions based on experience, knowledge acquired through education, or other sources of information. However, in the past 50 years research has repeatedly demonstrated that judgment is highly susceptible to systematic errors – cognitive and information-processing limits make us prone to biases that have negative effects on the quality of the decisions made.

Notably, there are three Nobel Prizes awarded to researchers whose scientific work clearly demonstrates that human judgment systematically deviates from rationality (Herbert Simon, Daniel Kahneman, and Robert
Shiller). Unfortunately, this is not a conscious, deliberate process, but rather the inevitable result of the way our brains are wired: we are predisposed to see order and causal relations in the world, we are overly optimistic, we are overly confident, and we process information in a way that confirms our existing beliefs, expectations, and assumptions. As a result, bias is “more influential than you think, and is the secret author of many of the choices and judgments you make” (Kahneman, 2011).

What kind of cognitive biases are there?
There are many different types of cognitive biases. Wikipedia lists more than 100, some with exotic names like the “Cheerleader Effect”, the “Gambler's Fallacy”, or the “Semmelweis Reflex”. However, of the 10 most pervasive cognitive biases, five are summarised below:

- **Confirmation bias**: the tendency to focus, interpret, weigh, and remember information in a way that confirms our existing beliefs and assumptions.
- **Authority bias**: the tendency to over-value the opinion of someone who is seen as an authority. As a result, we tend to be less critical when an “authority” makes a claim.
- **In-group bias**: the tendency to favour members of our own group over members of other groups, such as the evaluation of others, allocation of resources, etc.
- **Fundamental attribution error**: the tendency to over-emphasise personality-based explanations for behaviours observed in others, while under-emphasising the role and power of situational influences on the same behaviour.
- **Availability bias**: the tendency to overestimate the likelihood of events with greater “availability” in memory, which can be influenced by how recent the memories are or how unusual or emotionally charged they may be.

How do cognitive biases affect the management of virtual teams?
One could argue that the above cognitive biases may have an impact on the management of employees, virtual or otherwise. However, two of the aforementioned cognitive biases are more likely to occur when a team’s degree of virtuality is high:

*Fundamental attribution error*
According to attribution theory, people are inclined to find explanations (attributions) as to why others behave as they do. A person can make two types of attribution:

1. **internal** – the inference that a person is behaving in a certain way because of their internal characteristics, such as personality, skills, or knowledge, and
2. **external** – the inference that a person is behaving in a certain way because of external factors. It is typical, however, to place undue emphasis on external factors to explain one’s own behaviour or achievements, and an undue emphasis on internal characteristics to explain someone else’s behaviour.

Put differently, we attribute our successes to skills, but our failures to external factors, and, when judging other people, it is the other way around. In non-virtual teams this “attribution error” is corrected when a person learns more about the specific situation that his/her teammate is in. Because members of a virtual team tend to have a more limited knowledge of their teammates’ external situation, they are likely to make a larger number of attribution errors, which can have a negative impact on building relationships, cohesion, and trust (Ortiz De Guinea, 2012).

*Availability bias*
The availability bias can be a very useful strategy when making a decision. As the human
mind recalls frequently occurring events more easily than rare events, relying on the information that is “available” in our memory will in general lead to good decision-making. However, that information is also determined by factors unrelated to frequency, such as vividness and salience. For instance, managers conducting performance evaluations will more easily recall vivid examples of an employee’s behaviour (either positive or negative) than commonplace incidents, therefore vivid examples will be weighted more heavily in the evaluation (Bazerman, 2005). Further, those that rely heavily on intuition are more prone to availability bias.

The same availability bias is present in a virtual team (Golden, 2009). A member of a virtual team who is often in the office is likely to receive a more positive evaluation then a member who is out of the office most of the time, because the manager will be more aware of the achievements he/she can observe directly.

How can you prevent bias?
Unfortunately the prevailing view is that you can’t do very much about the negative impact of biases. Even Daniel Kahneman, Nobel laureate and the world’s leading authority on this subject, once stated: “I’ve been studying judgment for 45 years, and I’m no better than when I started. I make extreme predictions. I’m over-confident. I fall for every one of the biases.” We can improve only our ability to identify and understand cognitive biases, in others and eventually in ourselves. Or as Richard Feynman, another Nobel laureate puts it: “The first principle is that you must not fool yourself – and you are the easiest person to fool.” In at least some cases, an accurate diagnosis may suggest a timely intervention to limit the damage that biases and the ensuing bad judgments often cause.

Practical things to do
The “accurate diagnosis” is not easy. Awareness that decisions can be biased is clearly important, but it would seem almost impossible to correct biases (because they are hard wired into the brain). So here are a few ideas:

• the help of others could be sought (people with different perspectives and experiences may find it easier to detect our biases)
• be wary of the selection of the “other people” – their very choice may indicate a pre-disposition to go with established patterns of behaviour and will only seek to reinforce existing thinking
• examine assumptions and seek evidence upon which to base decisions and judgements. Reference to facts, organisational information, reviews from other managers when it comes to performance for example, so that the decision or conclusion is not based on memory alone
• for those that rely heavily on “gut feeling” or intuition to recognise they are probably more prone to availability bias
• identifying what information could challenge one’s preconceptions and actively looking for evidence that they might be suspect. There is tendency to proceed on the basis of whatever information/evidence exists and to overlook any gaps in the picture. If the manager looked back in a year’s time, what information might help him/her to make a good judgement, and is it possible to get more of that intelligence now (Kahneman, 2011)
• seek inputs from those we are judging, which may explain their behaviour and reveal that there may be external factors at work, rather than their innate personality or skills being responsible for the observed behaviour.
**SKILLS AND ATTRIBUTES OF EFFECTIVE VIRTUAL TEAMS**

Drawing upon the research results in the previous Sections, the following skills, attributes and practices would seem to be important in virtual teams and manager/leaders:

<table>
<thead>
<tr>
<th>MANAGEMENT STYLE</th>
<th>TEAM MEMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adopts a transformational management style</strong></td>
<td><strong>Respond well to a transformational style</strong></td>
</tr>
<tr>
<td><strong>Encourages participation and empowers team to take decisions</strong></td>
<td><strong>Able to self-manage</strong></td>
</tr>
<tr>
<td><strong>Recognises the importance of ensuring the psychological contract with team members is not damaged</strong></td>
<td><strong>Able to work well unsupervised</strong></td>
</tr>
<tr>
<td><strong>Combines diplomacy, coaching, facilitation and team defence</strong></td>
<td><strong>Can manage their own needs and maintain a boundary between home and work life</strong></td>
</tr>
<tr>
<td><strong>Recognises effort and accomplishment within the team</strong></td>
<td><strong>Able to progress personal development while working remotely (able to draw on colleagues in / outside the team for this purpose)</strong></td>
</tr>
<tr>
<td><strong>Doesn't micromanage</strong></td>
<td><strong>Do not need the structure of working in an office all the time</strong></td>
</tr>
<tr>
<td><strong>Manages by outcomes, not presence</strong></td>
<td><strong>Able to progress personal development while working remotely (able to draw on colleagues in / outside the team for this purpose)</strong></td>
</tr>
<tr>
<td><strong>Ensures visibility and availability to the team</strong></td>
<td><strong>Able to progress personal development while working remotely (able to draw on colleagues in / outside the team for this purpose)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERSONALITY</th>
<th>TEAM MEMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Listen – able to seek and interpret the context affecting the virtual team members to facilitate openness and trust</strong></td>
<td><strong>Team has a mix of personalities which are understood within the team, helping them work and adapt to each other’s needs</strong></td>
</tr>
<tr>
<td><strong>Cares about people as people and seeks inputs when they are apart – not allowing distance to become a barrier</strong></td>
<td>• <strong>similar levels of conscientiousness is helpful in avoiding conflict which is easy to trigger when working apart</strong></td>
</tr>
<tr>
<td><strong>Sets people challenges and supports their pursuit of them, using a mix of techniques (not just observation) to monitor performance</strong></td>
<td>• <strong>a mix of extraverts and introverts within the team helps if there are different conscientiousness levels and ensures enough leaders / followers</strong></td>
</tr>
<tr>
<td><strong>Inspires people to a shared vision and checks regularly when they apart – which is when this can degrade</strong></td>
<td>• <strong>are generally ‘agreeable’ which creates trust and cohesion – helping to sustain the team’s social characteristics with fewer face-to-face interactions</strong></td>
</tr>
<tr>
<td><strong>Coaches and develops team colleagues, using both face-to-face and remote methods to do so</strong></td>
<td>• <strong>have positive attitudes towards virtual working</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TASK CO-ORDINATION</th>
<th>TEAM MEMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Works with team to establish clarity of vision and how the goals contribute to the vision</strong></td>
<td><strong>Have agreed working practices / processes for co-ordinating tasks – these are documented / known by existing members and are shared with new team members as part of induction</strong></td>
</tr>
<tr>
<td><strong>Works to ensure precision in what is expected from team members – these expectations are agreed with members</strong></td>
<td><strong>Progress on tasks are made visible through use of specific project tracking technologies</strong></td>
</tr>
<tr>
<td><strong>Encourages team to celebrate successes even when apart</strong></td>
<td><strong>Members can schedule their tasks and plan work activities to suit their own requirements but align to those of the team (time and workload management)</strong></td>
</tr>
<tr>
<td><strong>Understands the nature of the tasks and can assign the best people to complete them</strong></td>
<td><strong>Use meeting agendas and are clear about outcomes, to ensure meetings stay on track and adhere to goals (virtual meetings are easy places for people to tune out)</strong></td>
</tr>
<tr>
<td><strong>Uses knowledge of team members to anticipate any isolation issues or communication problems</strong></td>
<td><strong>Use meeting agendas and are clear about outcomes, to ensure meetings stay on track and adhere to goals (virtual meetings are easy places for people to tune out)</strong></td>
</tr>
<tr>
<td>MANAGER / LEADER</td>
<td>TEAM MEMBERS</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Cohesion</strong></td>
<td>Are socially cohesive:</td>
</tr>
<tr>
<td>• Selects the right people for the team – based on knowledge of the task required and the skills / personalities of team members available</td>
<td>• know each other well</td>
</tr>
<tr>
<td>• Encourages the team to socialise and facilitates this by allocating time in meetings for this purpose and participating in social occasions</td>
<td>• like each other, socialise and interact well</td>
</tr>
<tr>
<td>• Monitors the quality of all forms of communication – seeking any signs that the cohesion is not being maintained</td>
<td>• ensure they spend enough time together face-to-face and are motivated to go out of their way to ensure the team is cohesive - i.e.:</td>
</tr>
<tr>
<td>• Encourages and respects differences in the team</td>
<td>• rely on team to some degree for social life and interactions so do this using remote technologies</td>
</tr>
<tr>
<td>• Watches for conflicts arising (listens closely and watches email etc. for signs) and seeks to achieve resolution and team harmony</td>
<td>• acknowledge that isolation can occur – for them or team colleagues and look for signs that others may experience this</td>
</tr>
<tr>
<td><strong>Communication richness</strong></td>
<td>• support each other when times are difficult</td>
</tr>
<tr>
<td>• Willingness to adapt to the preferences of the team with regards to communication styles – but is alert to the potential for:</td>
<td>Use a mixture of communication media - i.e.:</td>
</tr>
<tr>
<td>• misunderstandings</td>
<td>• use presence monitoring to keep in touch and chat</td>
</tr>
<tr>
<td>• lack of clarity</td>
<td>• use email for specific purposes – not everything</td>
</tr>
<tr>
<td>• adapting to the needs of others</td>
<td>• use video conferencing whenever possible to connect to each other's context and emotional wellbeing</td>
</tr>
<tr>
<td>• some people's needs being overlooked</td>
<td>• know and respect each other's preferences</td>
</tr>
<tr>
<td>• Ensures team members receive training in appropriate communication media</td>
<td>• comfortable and competent using a range of communication media</td>
</tr>
<tr>
<td><strong>Trust</strong></td>
<td>Trust each other (both affect and cognitive), i.e.:</td>
</tr>
<tr>
<td>• Has a propensity to trust others</td>
<td>• have a propensity to trust others</td>
</tr>
<tr>
<td>• Demonstrates trustworthy behaviour</td>
<td>• know each other well so trust is emotional</td>
</tr>
<tr>
<td>• Demonstrates adherence to procedural justice when dealing with individual team members and situations</td>
<td>• rely on cognition based trust aligned to their knowledge and experience of each other's skills and abilities with new team members</td>
</tr>
<tr>
<td>• Ensures team members are able to share their competence and skills with others – to build trust</td>
<td>• actively demonstrate trustworthy behaviour – do what they say they will do / be visible and accountable</td>
</tr>
<tr>
<td>• Demonstrates trust in others to encourage reciprocal behaviour</td>
<td>• trust each other well enough to challenge each other to further the team's goals and to raise issues</td>
</tr>
<tr>
<td><strong>Work relationships</strong></td>
<td></td>
</tr>
</tbody>
</table>
### MANAGER / LEADER

**Cognitive bias**
- Recognises the potential for bias to affect judgement, particularly when they don't see team members regularly
- Strives to re-set any biases when in a 1:1 situation and seek other views & input from team member when reaching conclusions about their performance

**Information sharing**
- Shares important information with the team – recognising that by being away from the office, it is less easy to absorb / find important information
- Shares information equally with the team
- Understands the power of a transactive memory system upon which the team can draw

**External communication**
- Supports the team in communicating with people external to the team
- Makes appropriate connections for team members where possible
- Ensures the team's success is visible to senior management

**Perceived supervisory support**
- Takes steps to judge performance on a range of inputs, not just those most recent, most frequently occurring, or associated with the presence of team members
- Spreads workload so that not only those in the office bear the burden of additional work, or work which needs to be done urgently
- Maintains a positive emotional ‘virtual’ climate – monitoring interactions between team members

### TEAM MEMBERS

**Cognitive bias**
- Recognise the potential for bias to affect the way they see and interact with colleagues
- Realise that “gut feeling” can be prone to availability bias (things that happen most recently)
- Seek additional inputs and evidence to challenge their biases and those of colleagues

**Information sharing**
- People freely share information to achieve the team goals
- People make the information available in ways that others can easily access – ensuring that everyone knows “who knows what”
- Proactively ensure that new members of the team have access to the knowledge about “who knows what”

**External communication**
- Communicate beyond the team’s boundaries to bring in new ideas and information to further the team’s performance and achievement of goals

**Perceived supervisory support**
- Highlight any perceived breaches of the psychological contract and raise using best communication method (generally 1:1 face-to-face interaction with manager)
- Pay attention to the quality of communications (particularly written ones) to ensure meaning is conveyed and misunderstandings avoided
APPENDIX – SOURCES


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