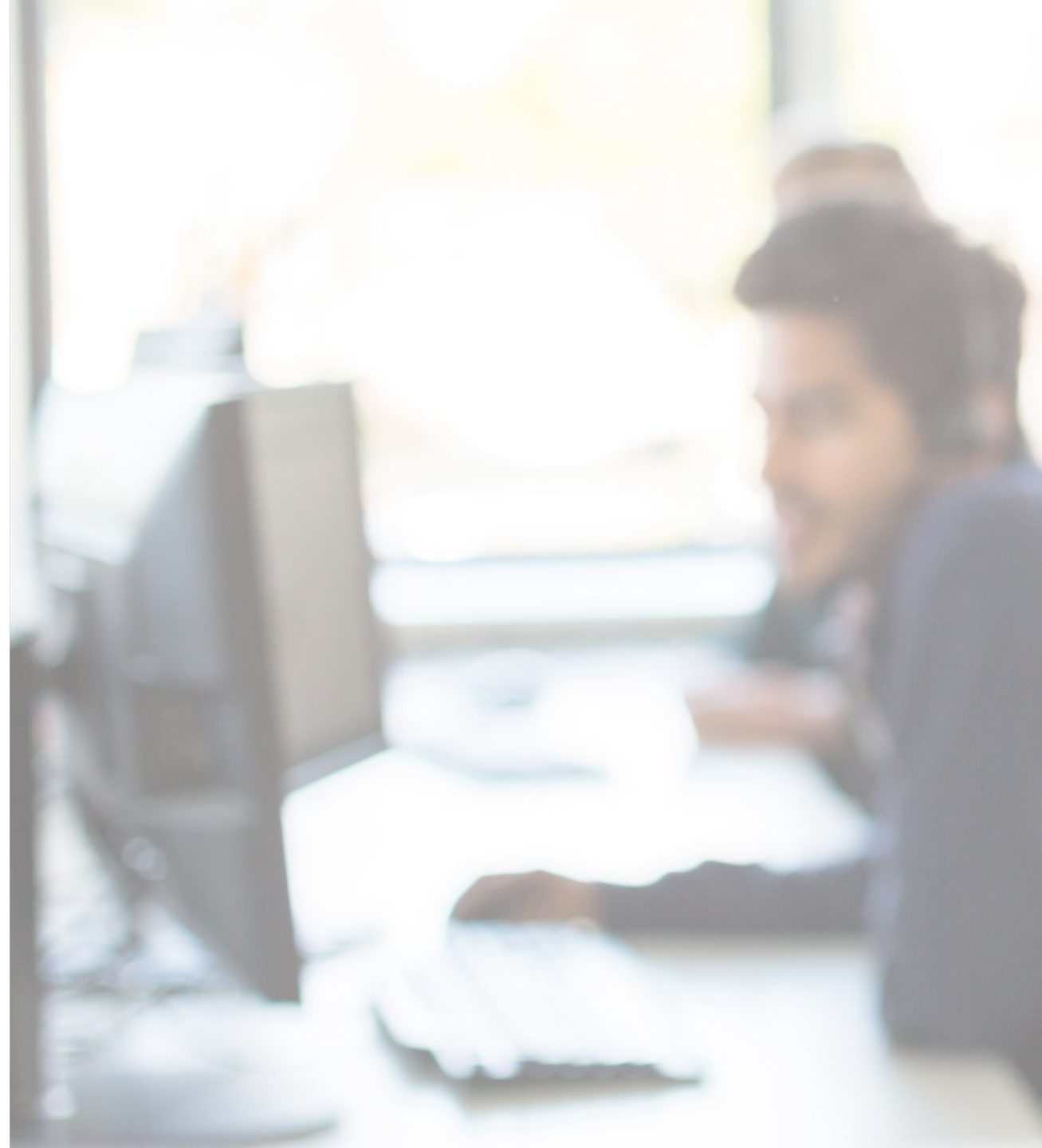




A Guide to Remote Proctoring / Invigilation



What are the factors driving an increased demand for online assessment & remote invigilation / online proctoring?

- Increasing demand for online education drives the need for a scalable exam process.
- Maintaining the integrity of an organisation's exams and preventing cheating.
- Candidates looking for increased flexibility in exam options.
- Organisations wishing to increase competitive advantage by providing candidates with an alternative to having to travel to a test centre.
- Avoiding the use of test centres has become a key driver during the Covid-19 pandemic, where congregating in groups to sit exams is not an option.
- Moving from a “big bang” exam approach to a high-frequency delivery model.
- Reducing pressure on exam hall space at key times of the year.
- Difficulty sourcing new test centres or exam partners in remote locations or for small numbers.
- Wider variety of questions and answer formats available than with paper.
- Reducing logistical issues of managing paper exams, secure courier costs, paper storage etc.
- Quicker turn-around for results by utilising online marking & moderation.

Remote Proctoring / Invigilation

A secure and flexible solution

There's no doubt that online assessment offers a very superior alternative to a pen and paper approach, with huge benefits for both the candidate and the organisation. That being said it poses a different problem – how do candidates access an online exam in a secure manner, which preserves integrity?

If you choose to run online exams at a test centre, you no longer just need a venue, tables, chairs and a supervisor, you now also need either a computer to be supplied for every candidate or to create a means by which they can bring their own laptops to a test centre and access the exam in a secure manner. Although you have the benefits of online assessment, you still have the logistical headaches associated with managing test centres. In addition, candidates are still required to take time out of work or family life to travel to the test centre.

The solution is remote proctoring / invigilation. This removes all the logistical issues around provision of exam halls and in-person invigilators. With remote invigilation the candidate can take their exam in any location and at any time, which provides a huge degree of flexibility to both organisation and candidate.



Remote Proctoring

Explained

Remote proctoring / invigilation re-creates the exam-hall experience online. Everything is done over the internet, and this not only makes it extremely scalable but also relatively quick and easy to roll out as a huge amount of the administration overhead is removed.

Having an online solution also means that candidates can take the exam from a location of their choice, such as their home or their office, and they are no longer mandated to travel to a test centre.

Remote proctoring fully authenticates the candidates, so the organisation knows that the correct person is presenting to sit the exam. It also uses various secure technologies for the duration of the exam to identify and deal with cheating. Depending on the way the remote proctoring is provided, the ratio of supervisors to candidates is usually much lower than in an exam hall.

There are a number of different types of remote proctoring solutions in the marketplace, but most (with some exceptions) involve the same basic components:

- 1) **Pre-Checks**— running system checks in advance of the exam to ensure that the candidate's computer and system are all set to support a remotely proctored exam;
- 2) **Candidate Authentication**— at exam time, verifying that the correct person has presented to sit the exam;
- 3) **Securing the Environment** – ensuring that the candidate is in a suitable environment in which to take the exam, without access to any sources of information that are not permitted;
- 4) **Candidate Supervision**— watching the candidate for the duration of the exam to make sure they don't do anything they are not supposed to;
- 5) **Reporting**— notifying the examining body of any issues that arise during the exam. For example, if a candidate behaves in a suspicious manner and breaks the exam rules, this is fully reported to the examining body.

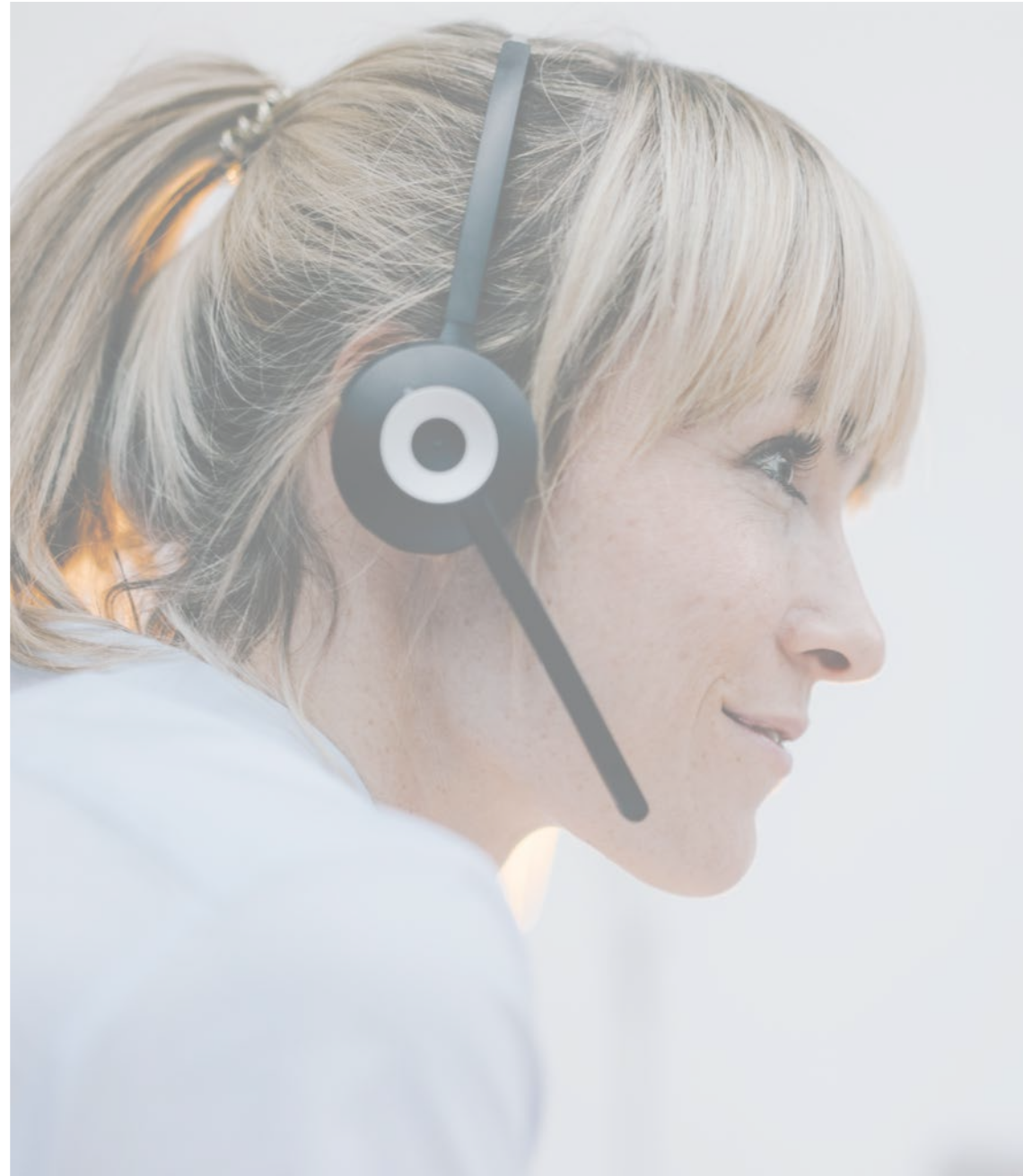
Remote Proctoring

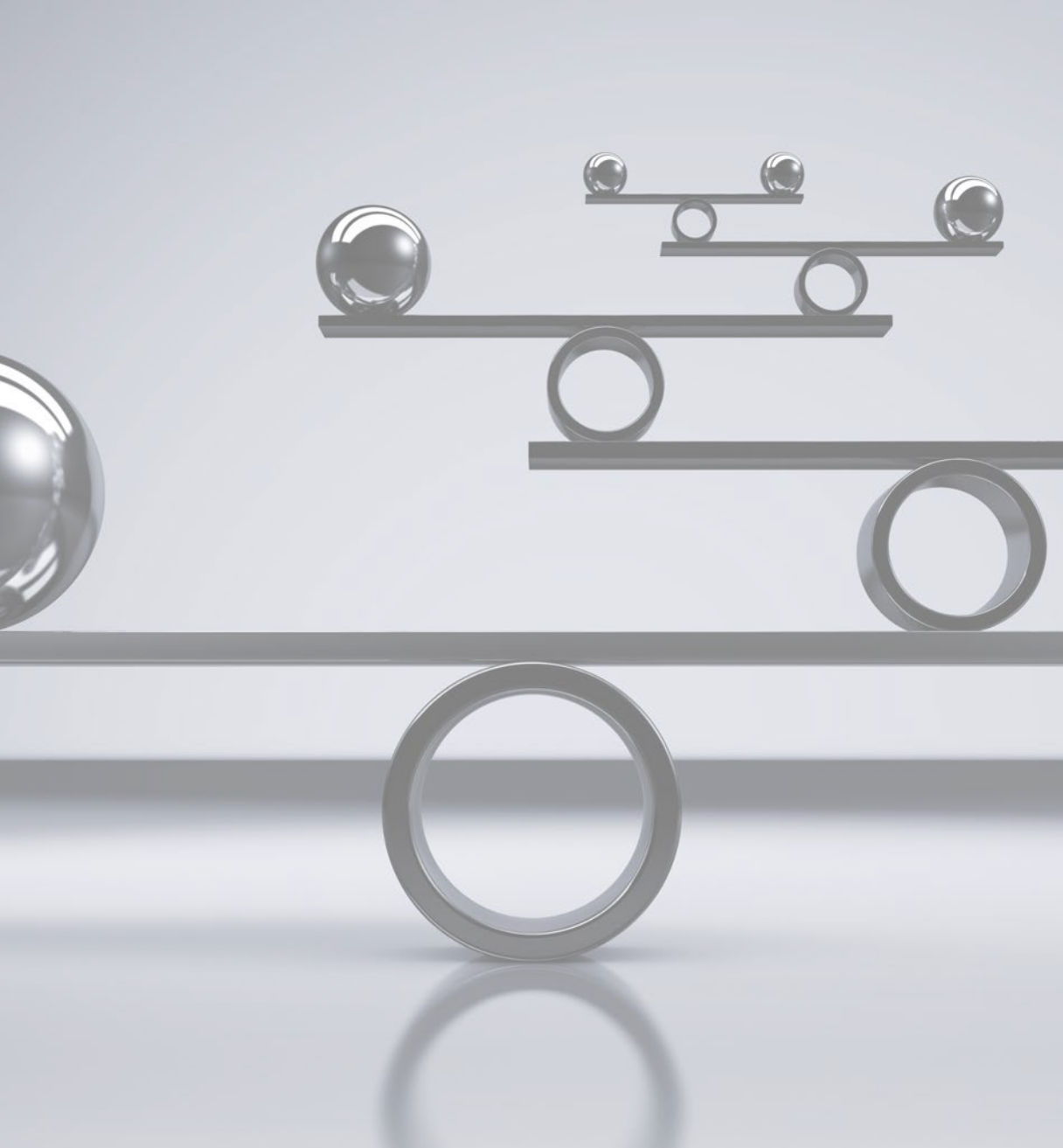
Rest assured...

The process of sitting an exam online with a remote, live supervisor watching the candidate for the duration of the test is relatively new and understandably questions will arise, as people satisfy themselves that it does preserve the integrity of the exam by deterring and preventing cheating.

Given this backdrop, it has to be remembered that with remote proctoring, candidates are monitored a lot more closely than in an exam hall. TestReach is a remote proctoring solution provider, with experience monitoring tens of thousands of exams and has comprehensive procedures to detect and deal with suspicious behaviour, which we go through with our customers in advance of roll out.

For high-stake exams, candidates tend to be nervous so the importance of having a friendly, competent and supportive supervisor to guide and reassure candidates cannot be underestimated.



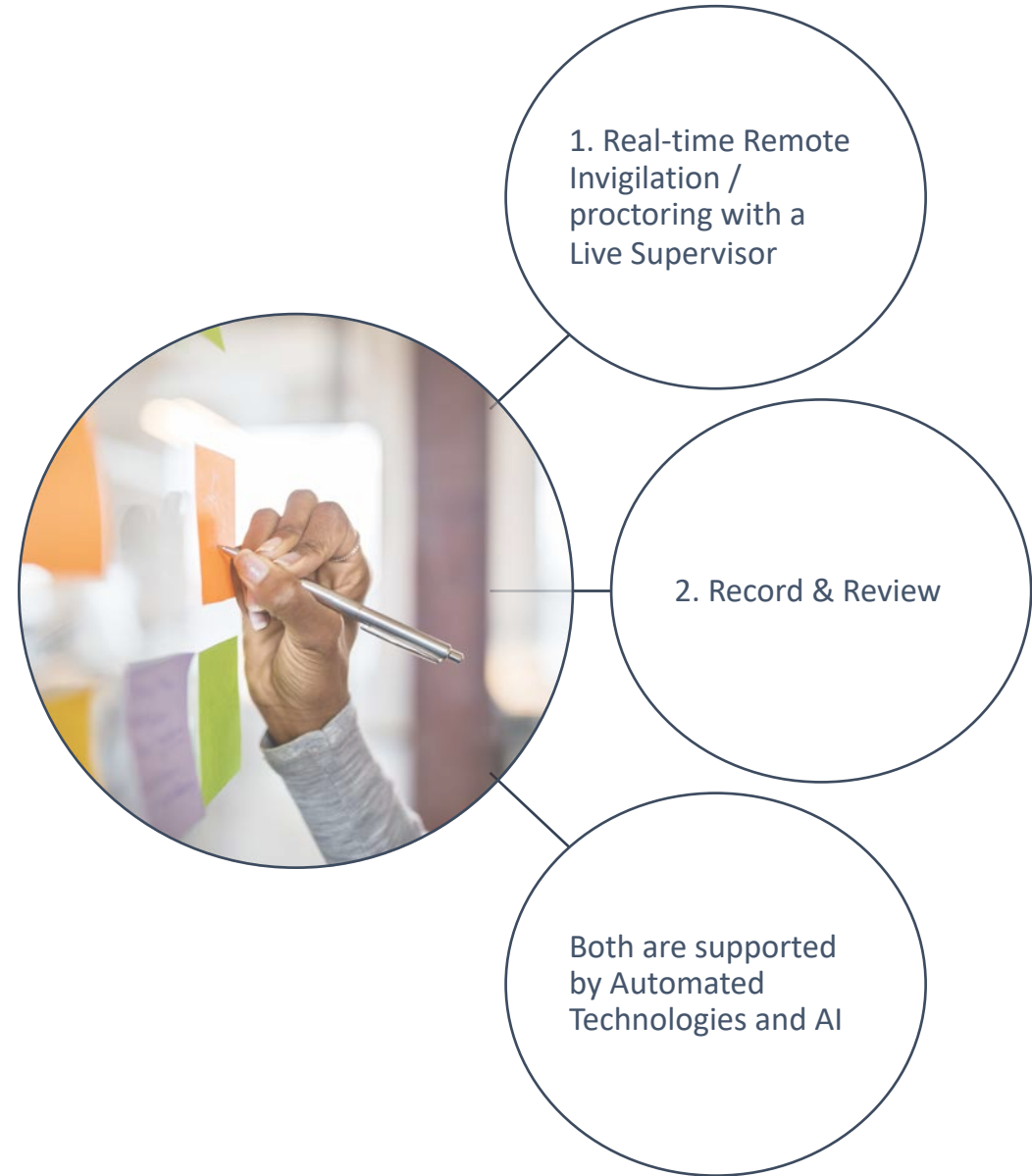


Everything considered, remote proctoring offers such significant benefits over face-to-face exams, that it's not really a case of "if" it will be adopted at scale, it's more a case of "when". The COVID-19 pandemic has also accelerated the use of this technology due to restrictions on congregating in test centres.

With many providers offering a cloud-based solution, there is the added advantage that it can easily be piloted or tried out for one specific cohort or exam. This can help build the business case and get stakeholder buy-in, particularly as initial candidates can be surveyed to get their feedback as part of the process.

Know your options

There are currently two different kinds of proctoring solutions, both of which can incorporate different types of automated technologies to varying degrees.



1. Real-time Remote Proctoring with a Live Supervisor

With this option, candidates are connected to a supervisor (supplied by the vendor) over the internet, who will closely monitor the candidate via video, audio and remote screen share. Everything is usually recorded and, if required, can be reviewed at a later time by the examining body.

Once connected the supervisor will run through a number of steps to authenticate the candidate and secure the environment. This may involve checking official photo ID or panning their webcam around the room. The steps involved will depend on the specific rules of the exam. The supervisor will then provide access to the exam, following which they continually watch over the candidate for the duration of the test. Most providers will have a maximum ratio of candidates to supervisors, which is usually significantly lower than most test centre conditions.

Providers will agree exam protocols with the examining body in advance. For example, what happens if a phone rings during the exam? The online supervisors then implement the rules specified by the examining body. If the candidate infringes any of the protocols, the supervisor raises an “infringement” and the candidate must acknowledge this before continuing. If the infringement has been agreed with the examining body as being very severe, this may even lead to the supervisor terminating the exam.

Alternatively for more minor infringements a warning may be given, which usually serves as a deterrent. Without a live invigilator to intervene, any actions can only be taken after the exam, meaning that security of the exam could already have been compromised.

The major advantages of live supervision over record and review, include:

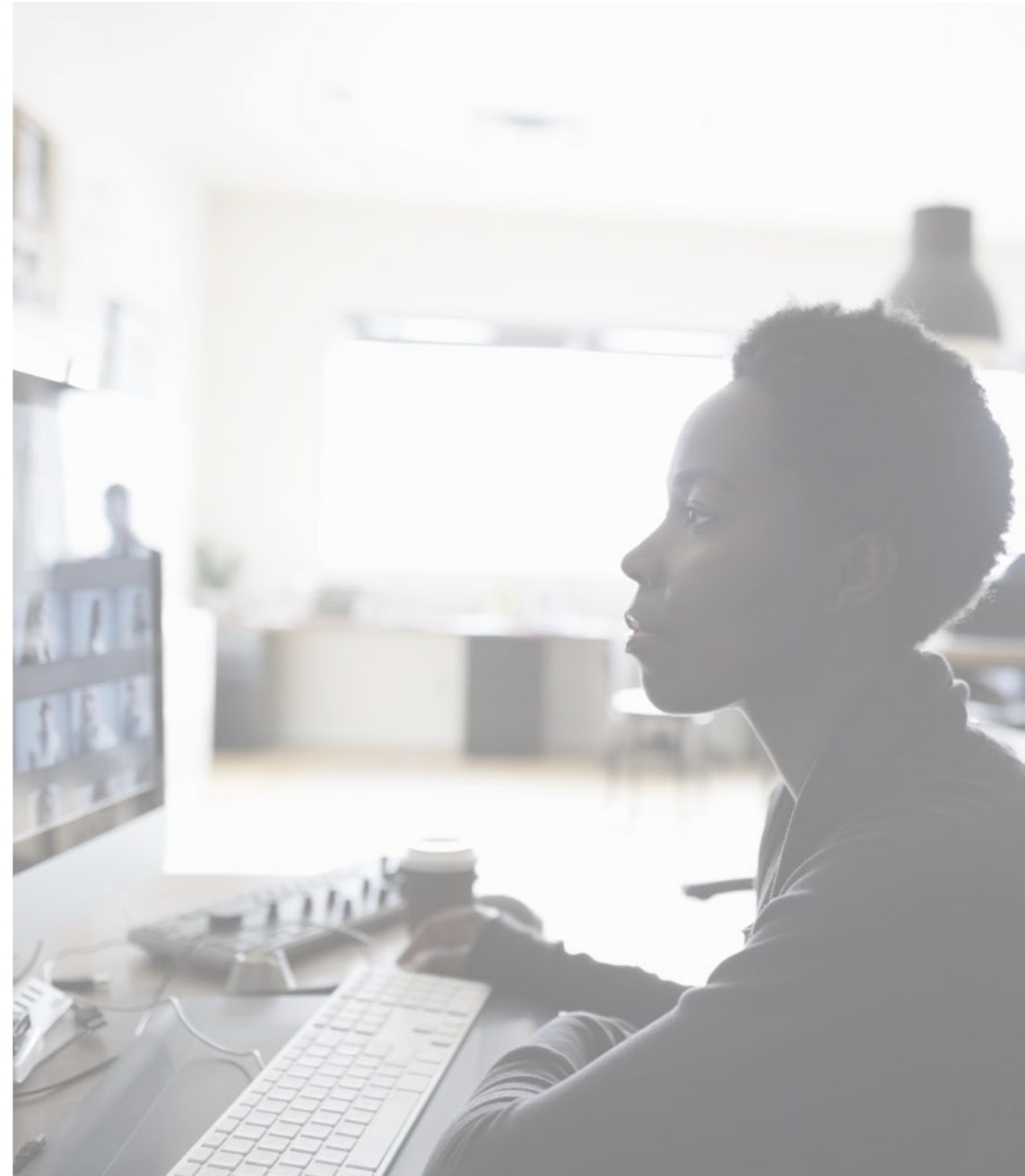
- ✓ If exceptional circumstances arise, they are immediately captured and dealt with through an infringements process.
- ✓ Anything suspicious can be fully investigated at the time by the supervisor. Video evidence, reviewed after the event, is mostly inconclusive.
- ✓ The supervisor will intervene in real time if questions are being transcribed.
- ✓ Live monitoring prevents “false flags” that may arise when automated detection technologies are used, for example if there are changes in lighting, or external noises.
- ✓ Since infringements are time stamped this allows examining bodies to pinpoint areas of the video which require review rather than having to scour through hours of recorded video.
- ✓ Trained invigilators can re-assure and provide direct support to candidates, for example if they have questions about how to navigate the exam.

2. Record and Review

With these solutions, the exam supervision is effectively off-line. The candidate is guided through an automated authentication process before the exam commences, which may consist of taking a clear picture of themselves, holding up official photo ID to the camera or some sort of biometric scanning. For example, this might be using the keyboard to type in a sentence displayed on the screen, and the keystroke pattern captured can be matched to an existing base pattern to validate identity.

There may then be some additional automated steps to secure the environment after which the candidate is given access to the test. During the exam everything is recorded and once the test completes, the recordings are then reviewed in one of the following ways: (i) manually by trained reviewers from the provider, (ii) manually by resources from the examining body or (iii) via special software. If the review is manual, usually videos are watched at a higher speed to reduce the effort involved. Some providers also offer a sampling service, where every n^{th} video is reviewed. All suspicious behaviour identified is reported to the examining body.

Although this approach may have a cheaper price point as there is a lower level of human involvement, there are some obvious drawbacks. There are no people on the day to guide candidates during their exam, so candidates have less support. There are usually no real-time interventions, so if someone is blatantly cheating or copying the questions you won't find out until well after the event, if at all. You only ever have a recording of what happened, so it is not possible to carry out further investigations, say by asking the candidate to pan the camera to a specific area. **Record and review is therefore more suited to lower stake testing, and tends not to be an option favoured by regulators.**



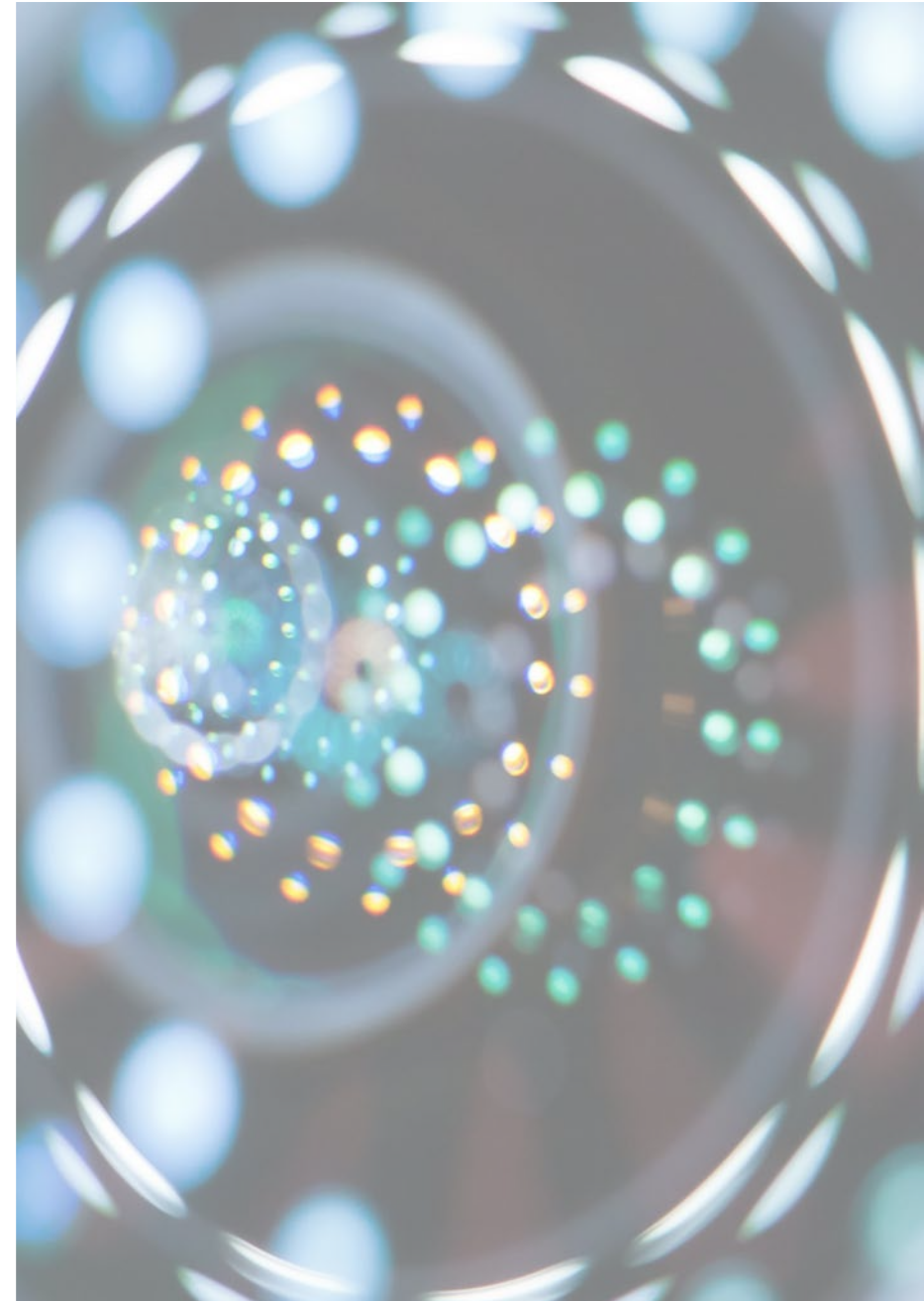
Automated Technologies

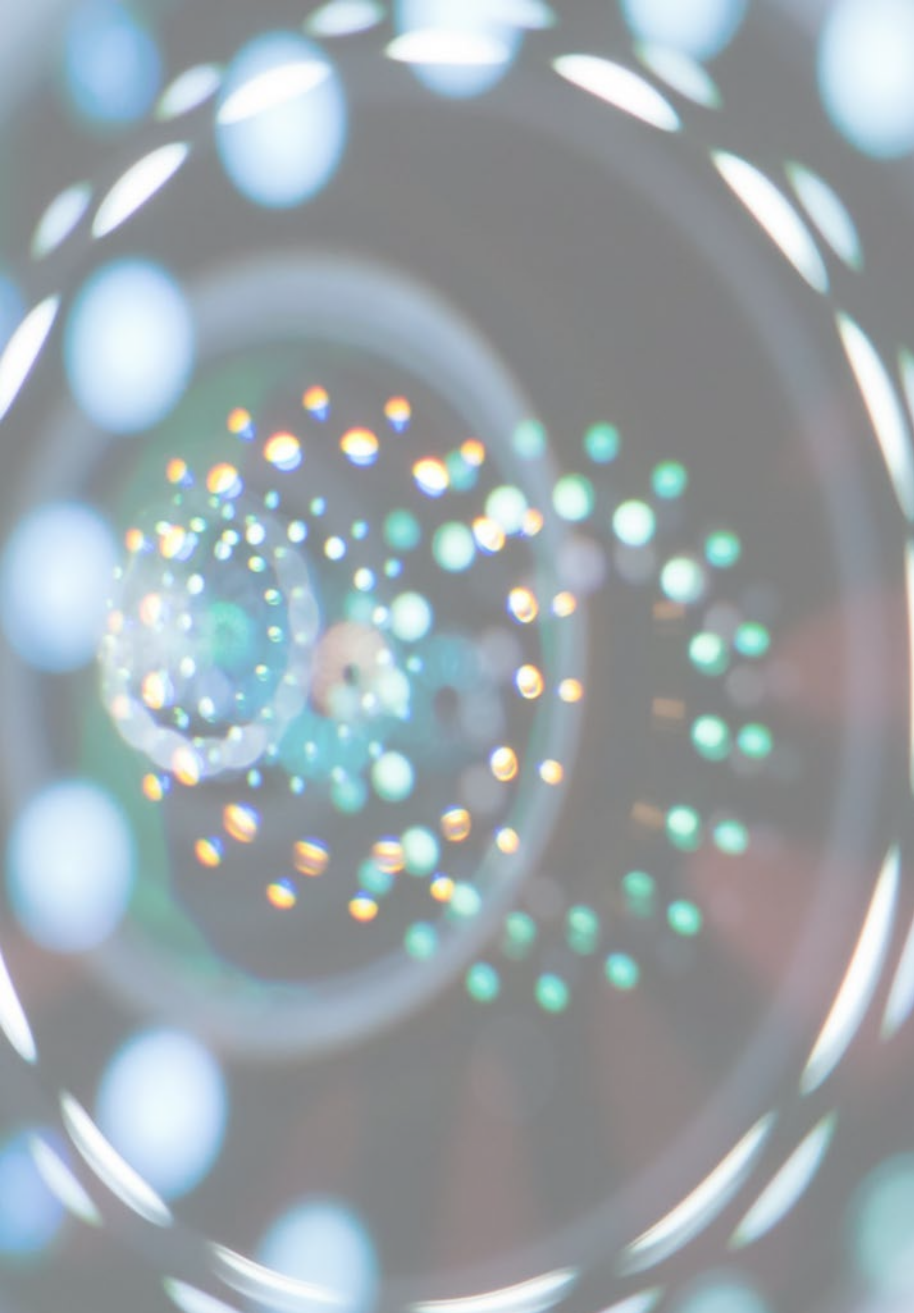
A number of automated technologies can be used at various stages in both real-time and record & review proctoring solutions, as follows:

Biometric scanning or **facial recognition** to check the candidate's identity. For example, the candidate is asked to type in a sentence displayed on the screen, and the keystroke pattern captured can be matched to an existing base pattern to validate the candidate's identity (because how we type is like a fingerprint). Data captured at this stage may be immediately matched against a base pattern or their facial scan can be compared to their photo ID, or it may just be held on file for later review.

Detection software that automatically tracks factors such as eye movement, behaviour or monitors sound levels. If these factors move outside calibrated thresholds then red flags are raised, which trigger actions. For example, for record and review solutions, detection technologies are often used to mark the video at points where red flags are detected. These specific sections of the video can then be reviewed after the exam.

At this point, these kinds of detection technologies are quite limited, so there does tend to be quite a lot of “false positives”, where, depending on the approach, examining bodies may be left with hundreds of hours of video footage to review. The calibration step is essential. In the case of over sensitivity there may be a large number of false red flags raised, but on the flip side, under sensitivity can lead to suspicious behaviour being missed. Detection software can also be used to alert a supervisor to a specific issue during a live exam, which they can then further investigate.





And Artificial Intelligence (AI)?

Artificial Intelligence (AI), is where machines “learn” intelligence and how to behave like humans. In a remote proctoring context, this means that a computer would have to watch hundreds of thousands of hours of exams and over time, would learn how to recognise suspicious behaviour based on training and complex programming algorithms.

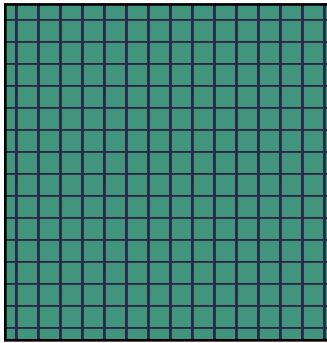
Although humans can easily process videos and recognise images, for computers, image processing is incredibly complex and even huge image recognition giants like Google Cloud Vision and Microsoft Computer Vision often incorrectly identify static images. Suspicious behaviour tends to be subtle and is often difficult to detect, even for a human.

For a computer to process a video and audio feed for the duration of an exam and to be able to identify suspicious behaviour with any degree of certainty, is just not a reality at this point in time. That’s not to say it won’t be possible into the future, but we still have a long way to go....

Technology Approach

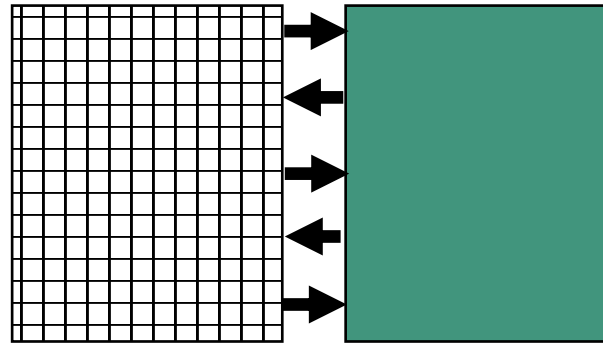
There are three different technology approaches, when it comes to delivering remote proctoring

1. All-In-One



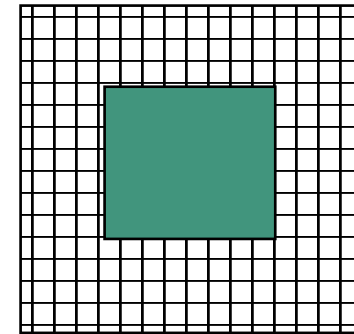
All-in-one System that includes both assessment software and remote proctoring within the same application.

2. Integrated



A “bolt on” proctoring system that is integrated with a separate online assessment tool. Typically, the systems are from different vendors.

3. Embedded



3rd party remote proctoring system is embedded / white labelled) inside the assessment software system, like a “black-box”.

Ensure a seamless end-to-end user experience

It is important to understand the technology approach...and to understand the benefits of an all-in-one application that includes integral remote proctoring.

When looking at embedded or integrated proctoring options, keep in mind the following key points, which will impact on the professionalism and security of your proctoring:

- Depending on the integration things can get confusing for users when they are transferred between systems which look quite different. In addition, although integrations typically work well for the general case, they may cause problems for exceptional scenarios, so make sure these are fully tested.
- Implementing two systems means that exam data and reports generated by one, will not offer the full picture. Administrators will have to collect relevant data from both systems and collate where necessary.
- If there are problems, you have to deal with two suppliers to try and figure out what has happened.
- The supervisors (or proctors) have no knowledge of the underlying assessment application. For example, if a nervous candidate asks a question, the proctors just give a standard answer of “Please continue with your exam as everyone is in the same situation”, which can be very frustrating for test-takers.
- When using two separate systems there is a risk of passwords being compromised or candidates accessing the exam without being remotely invigilated.
- With an integral all-in-one solution there is absolutely no way that candidates can get access to a remotely proctored exam without going through the remote proctoring process.

Asking the right questions

When considering your options for a remote proctoring supplier its important to know...



Your Candidate Profile

Understand the capabilities your candidates. If they are less technologically literate, then make sure to select an intuitive system that is user friendly. Will they be comfortable dealing with a machine for some or all of the process, or will they expect to deal with a person?



Can the System Meets your Needs

Run a pilot and see for yourself how exactly the system works and if it can properly meet your specific needs. If you want to take a conservative approach, use your own internal employees or candidates and run a practice exam. The experience will prove very worthwhile and may unearth factors which you had not previously considered.



Supplier's Track Record

Make sure your supplier has a good track record of delivering exams similar to your own requirements. Ask for and speak to references as they will have been through the process. This will validate the credentials of the supplier and may offer some good advice.

Asking the right questions

When considering your options for a remote proctoring supplier its important to know...



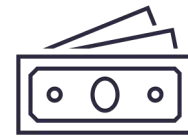
Candidate to Supervisor Ratios

Find out the ratio of candidates to supervisors and make sure you are happy with the figures.



Support Provided

Check out the support service your vendor offers. For example, what are the core support hours? Where is the support team based?



Costs

Understand the costs involved and how they are calculated. Sometimes there may be hidden charges relating to new modules or upgrades, which need to be fully explored in advance.

Asking the right questions

- When considering your options for a remote proctoring supplier its important to know...



Data Privacy Implications

Be aware of the implications of data privacy, particularly if you are dealing with candidates in different countries. Will candidates have to agree to a data privacy statement before they start using the system?



Location of Data

It is important to understand where candidate data will be held. If the provider is non-EU based, it is likely that the data will be held outside of the EU and so may not be subject to EU data protection.



Underlying Technology

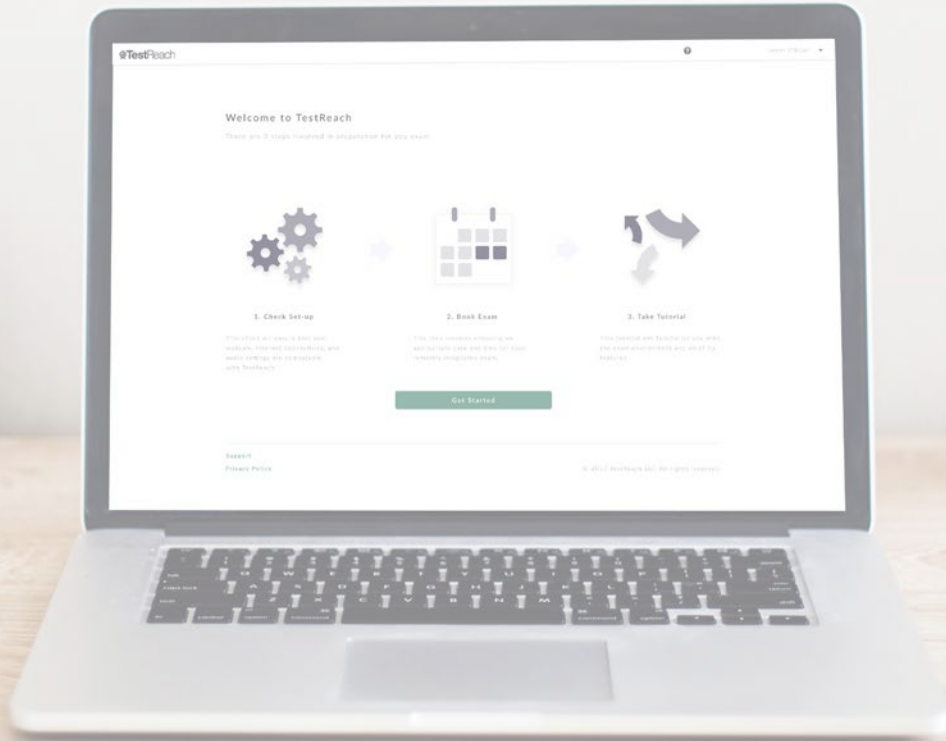
Carry out due diligence on the underlying technology used. Some providers may use deprecated technologies such as Flash or Java, so if a candidate is using a work-provided laptop, they may run into issues or be blocked by firewalls.



Supervisors

Whether you call them invigilators, supervisors or proctors, what things should you consider?

- Are they business-like?
- Do they speak the language?
- Do they know anything about the underlying assessment system?
- Is there are cultural fit?
- Where are they based?
- They are representing your brand and speaking to your candidates – **it is essential that your candidates are left with a positive impression**



TestReach is a total online assessment solution. It is a cloud-based combined assessment and remote proctoring / invigilation system, so you can create your exams within the platform, and then turn on remotely proctored exam delivery when required. With this option set, for the duration of the exam the candidate is connected to a trained supervisor by video, audio, remote screen share and instant message, and everything is recorded for later review if required. With an open API, TestReach is very easily integrated with your existing systems, so that everything is seamless and the need to re-key data is eliminated.

The TestReach exam assessment software includes the full end-to-end range of capabilities including a collaborative question authoring platform, test assembly features, exam delivery, marking, moderation and reporting. Exam delivery options include online or offline in test centres, assignment upload and remote proctoring.

TestReach offers the flexibility to meet all your current and future assessment needs within one single application.

To learn more visit www.testreach.com



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