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REMOTE CONFORMITY ASSESSMENT IN A DIGITAL WORLD

Opportunities, challenges and implications for developing countries

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REMOTE CONFORMITY ASSESSMENT

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ACKNOWLEDGEMENTS

DISCLAIMER

FOREWORD

Quality Infrastructure (QI) is the combination of initiatives, institutions, organizations, activities and people that help ensure products and services meet the requirements of customers. Conformity assessment is central to this important work as it links regulation, industry and markets.

For over 50 years, the United Nations Industrial Development Organization (UNIDO), the specialized United Nations agency mandated to promote inclusive and sustainable industrial development, has supported the establishment and upgrading of standards and conformity assessment structures worldwide. UNIDO utilizes a holistic approach to QI development, from building awareness of QI to helping initiate, develop and strengthen a fit-for-purpose QI that operates efficiently and cost effectively. This thereby helps developing countries increase their productive capacity, export base and domestic and foreign investment.

The trend towards digitalization—characterized by the ever-increasing connection between people, technology and industry—is changing the way QI and conformity assessment is being delivered. Though remote assessment techniques have existed for many years, their use has been accelerated by the COVID-19 pandemic. The variety of technologies now available for remote assessment is injecting great dynamism into conformity assessment activities.

The use of remote assessment presents many exciting opportunities and benefits such as stimulating a rethink of the entire assessment process, the ability to conduct assessments in locations that may otherwise be difficult to access and reduced environmental footprint. Despite the many upsides of remote assessment, challenges also exist relating to technology and infrastructure, data and information, processes and organizational culture change.

While consideration should be given to the implications of remote assessment specific to the developing country context (concerning connectivity, lack of information and skills), developing countries can also exploit the respective opportunities which include access to global expertise and peer learning.

Looking to the future, developing countries need to keep up with the latest developments in the increasingly digitalized world of conformity assessment to ensure they are not left behind.

In this regard, UNIDO stands committed to continuing its support to developing countries, assisting them in analyzing the implications, overcoming the challenges and making the most of the opportunities posed by the growing use of remote assessment techniques. UNIDO's continued efforts ultimately contribute to the achievement of the 2030 Agenda for Sustainable Development to the benefit of people, our planet and prosperity.

Gerd Müller

Director General, UNIDO

EXECUTIVE SUMMARY

The document is structured as follows:

PART 1 describes the evolution of remote assessments and the associated requirements and guidance available, from 2000 to the present.

PART 2 looks at the opportunities and benefits that remote assessment methodologies can provide as part of digital transformation initiatives, as well as some of the associated challenges and how they might be overcome.

PART 3 considers a range of different conformity assessment scenarios, including management system, product and personnel certification, certification to Voluntary Sustainability Standards, Organic certification, inspection, testing, accreditation and peer assessments.

PART 4 looks to the future use of remote assessments in the post-COVID era.

PART 5 draws conclusions and outlines a set of pragmatic recommended actions for developing countries.

ANNEX I provides an extensive bibliography for those who wish to obtain more detailed information.

ANNEX II gives more details about the UNIDO Expert Group Meeting which provided inputs for this publication.

NOTE: The document makes reference to—but in no way substitutes or modifies—a number of requirements and guidance documents published by entities such as ISO, IEC, IAF, ILAC and ISEAL Alliance, as well as by various sector-specific scheme owners. Over the years these have evolved to facilitate, rather than to preclude or restrict, the use of remote assessment/audit methodologies. Those who are new to the use of remote assessments/audits (whether they are from developing or developed economies) are recommended to consult these as appropriate for their own specific context.

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ACRONYMS AND ABBREVIATIONS

AB	Accreditation Body
ABCB	Association of British Certification Bodies
AFRAC	African Accreditation Cooperation
AI	Artificial Intelligence
ANAB	ANSI National Accreditation Board (USA)
AR	Augmented Reality
BSI	British Standards Institute
CAB	Conformity Assessment Body
CB	Certification Body
DTI	(UNIDO) Department of Digitalization, Technology and Innovation
EGM	Expert Group Meeting
EMA	Entidad Mexicana de Acreditación
FSC	Forest Stewardship Council
GAC	Georgia Accrediting Commission
GFSI	Global Food Safety Initiative
GlobalGAP	Global Good Agricultural Practices (Certification Scheme)
IAF	International Accreditation Forum
IAOB	International Automotive Oversight Bureau
IATF	International Automotive Task Force
ICONTEC	Colombian Institute of Technical Standards and Certification
ICT	Information and Communication Technology
IEC	International Electrotechnical Commission
IIOC	Independent International Organisation for Certification
ILAC	International Laboratory Accreditation Cooperation

IOAS	International Organic Accreditation Service (original name)
IQNet	The International Certification Network
ISEAL	International Social and Environmental Accreditation and Labelling Alliance
ISO	International Organization for Standardization
ISO/CASCO	ISO Policy Committee on Conformity Assessment
IT	Information Technology
JANAAC	Jamaica National Agency for Accreditation
MLA	Multilateral Recognition Arrangement
MRA	Mutual Recognition Arrangement
MSC	Marine Stewardship Council
NAB	National Accreditation Body
NABCB	National Accreditation Board for Certification Bodies (India)
RFA	Rainforest Alliance
ROV	Remotely Operated Vehicle
RvA	Raad voor Accreditatie (Dutch Accreditation Council)
SAAS	Social Accountability Accreditation Service
SADCAS	Southern Africa Development Community Accreditation Service
SDG	(UN) Sustainable Development Goal
SOAC	Système Ouest Africain d'Accréditation (West African Accreditation System)
SWOT	Strengths Weaknesses Opportunities and Threats
TIA	Telecommunications Industry Association
UKAS	United Kingdom Accreditation Service
UNCTAD	United Nations Conference on Trade and Development
UNFSS	United Nations Forum on Sustainability Standards
UNIDO	United Nations Industrial Development Organization
VDTüV	Verband der TÜV (German Association of Inspection Bodies)
VR	Virtual Reality
VSS	Voluntary Sustainability Standards
WAAS	West African Accreditation System
WRAP	Worldwide Responsible Accredited Production
WTO	World Trade Organization

1. Introduction

The global outbreak of COVID-19 in early 2020 changed many aspects of life and brought about an accelerated use of technology. With global lockdowns and the restriction of physical (face-to-face) interactions worldwide, the pandemic meant that the conformity assessment community was faced with a significant challenge—to transition (in some cases very rapidly) to the use of remote assessment/audit methodologies as a means to provide ongoing confidence in associated attestations of conformity;[2] to extend the validity of such attestations without having the possibility to conduct "traditional" assessments/audits; or to suspend the validity of the attestations. This was not always an easy decision, and one that depended (and still depends) on the utilization of "risk-based thinking" that is implicit in good conformity assessment practice[3] and explicit in some specific standards such as ISO/IEC 17021-1[4] for the auditing of management systems. This includes consideration of the risks associated with NOT being able to perform conventional conformity assessments and the considerable opportunities that can be provided by using remote assessments to overcome this. One thing is clear—the opportunities that arose out of necessity during the pandemic can now be leveraged further to the benefit of all concerned, as more and more countries continue their digitalization journeys.

> **Conformity assessment** involves a demonstration that specified requirements for products, services, processes, people or systems have been fulfilled. Such requirements may typically be specified by international, regional or national standards and technical regulations. Conformity assessment bodies (CABs) may be public or private entities that provide services such as testing, inspection, validation, verification, and certification of products, processes, people or management systems.

NOTE – Throughout this document, we use the term "assessor" in the broad sense, to include anyone who is carrying out a conformity assessment activity (this could be, for example, an inspector, an auditor, a laboratory technician, an accreditation body assessor or a peer evaluator).

1.1 THE ORIGINS OF REMOTE ASSESSMENT

The use of remote conformity assessment methodologies is not a new phenomenon—its origins can be traced back to the pre-smartphone, pre-WIFI era, with the use of tools such as (analogue) video recorders and teleconferencing to supplement traditional face-to-face techniques. Concerns about the potential abuse of such methodologies led to the development and publication (in 2008) of the first edition of IAF MD4,[5] with a focus on using "Computer Assisted Auditing Techniques" (CAAT) to enhance audit effectiveness and efficiency to support and maintain the integrity of the audit process.

The stated intention of MD4 was to:

a) "provide a methodology that is sufficiently flexible and non-prescriptive in nature to satisfy the needs of industry, by allowing client organizations and their respective certification bodies to use CAAT to enhance the conventional audit process, and

b) ensure that adequate controls are in place with sufficient accreditation body oversight to avoid abuses and to prevent excessive commercial pressures that could compromise the integrity of the certification process."

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[2] "Issue of a statement, based on a decision, that fulfilment of specified requirements has been demonstrated" (ISO/IEC 17000:2020 "Conformity assessment — Vocabulary and general principles")

[3] ISO/IEC 17060:2021 "Conformity assessment — Code of good practice"

[4] ISO/IEC 17021-1 "Conformity assessment – Requirements for bodies providing audit & certification of management systems Part 1-Requirements"

[5] IAF MD4:2008 "IAF Mandatory Document for the use of Computer Assisted Auditing Techniques ("CAAT") for Accredited Certification of Management Systems" (now superseded)

Specific approval was required from the accreditation body for cases where remote auditing activities represented more than 30% of the planned on-site auditor time, prior to their implementation.

Accreditation provides additional confidence in the competence, consistent operation and impartiality of CABs to perform their activities. Accreditation of CABs is based on international standards developed by ISO's Conformity Assessment Committee (ISO/CASCO), including ISO/IEC 17025 (for laboratories), ISO/IEC 17020 (for inspection bodies), ISO/IEC 17021-1 (for management system certification bodies) and ISO/IEC 17065 (for product certification bodies). Accreditation is usually provided by a National Accreditation Body (typically, but not always, one per country) or by a Regional Accreditation Body (in some smaller economies where the establishment of a National Accreditation Body might not be justified).

1.2
EVOLUTION

Over the course of the last ten years, the following two key sets of factors affected the overall approach to remote conformity assessment methodologies, which (of necessity) became increasingly integrated into the mainstream conformity assessment toolbox:

» The introduction of remote working and working from home, and the establishment of "virtual locations", particularly in the IT and service sectors, making the use of "face-to-face" assessments in such cases largely irrelevant and unnecessary.

» The rapid evolution of ICT, to include ultra-fast wireless internet, the development of smartphone technology, social media interactions, remote meeting platforms, real-time access to process information, Internet of Things (IoT), big data analytics and the general digitalization of business, all of which have led to what we now know as "Industry 4.0".

1.3
WHERE WE ARE TODAY

Today, remote assessments can make use of new technologies such as virtual and augmented reality headsets, smart glasses, drones, satellite mapping, real-time data analysis and many other technologies that provide a myriad of options to make conformity assessment activities more dynamic and rigorous than ever before. But with these opportunities come risks—risks associated with information security and data protection, new competence requirements for those involved in conformity assessment activities and the need to ensure appropriate (random or assessor-driven) sampling.

All of these developments meant that in general the conformity assessment community in developed economies was reasonably prepared for the challenges brought about by the COVID-19 pandemic, if not by the speed and extent of its onset. In many developing countries, however, there were, and often still are, shortcomings in the institutional frameworks, IT infrastructure and the availability of conformity assessment providers and personnel that are demonstrably competent and recognized in destination markets. A positive outcome of the more universal acceptance of remote assessment is that they could be used by organizations based in these developing regions to access conformity assessment activities from more developed regions. This will have varied impacts for different countries.

2. Applications of Remote Assessments

2.1
OPPORTUNITIES AND BENEFITS

In the pre-COVID era when traditional "face-to-face" assessments were the default approach, the use of ICT to conduct remote assessments had already begun to provide new opportunities that could be used to enhance traditional methodologies.

The benefits that could be derived from remote assessments meant that by 2019 they were starting to be used to a greater or lesser extent in all economies (both developed and developing), as part of the overall move towards the global digitalization of quality infrastructure-related activities. The uptake was, however, undoubtedly

slower in many less-developed countries, primarily because of cultural, technological and infrastructure considerations, as well as the lack of availability of competent personnel. Some of the benefits of remote assessments, regardless of the specific application or modality, are shown in the following box.[6]

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SOME BENEFITS TO BE DERIVED FROM REMOTE ASSESSMENTS

»   Enhanced sampling by providing easier access to remote locations without the need for a physical presence by the assessor

»   Ability to conduct assessments of virtual locations (increasingly common with the global trend towards working from home)

»   Ability to conduct assessments in locations that may otherwise be difficult to access (at the macro level, considering geopolitical aspects; at the micro level, in terms of hazardous materials or working environments)

»   More efficient use of assessor and clients' time

»   Access to subject matter experts and more experienced assessors whose participation was not previously feasible but who can contribute remotely

»   Reduced travel-related costs and travel time

»   Reduced risk of travel-associated health issues for assessors (including mental health)

»   Reduced environmental footprint

»   Easier and more efficient oversight of the audit/ assessment process in real time

»   More efficient interactions with small and medium-sized enterprises and experts in audits/ assessments

»   Assessments can use a blended approach of different remote and face-to-face methods

»   Assessments can be planned as a series of smaller "bite-sized" events

»   Ability to use local facilitators, supported remotely by more experienced auditors or experts in real time if necessary

»   Possibility for trainees (in both the CAB and the organization) to observe and provide feedback to assessors

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With the onset of COVID-19 at the beginning of 2020, the whole context changed. Remote assessment no longer represented just a "good opportunity to do things better"—it became a strategic imperative as a way (in many cases the ONLY way) to provide continuity in conformity assessment activities. The extent to which this was the

case depended of course on the circumstances of the individual countries and regions in question, the severity of the crisis and travel/social distancing/lockdown rules.

The underlying decision-making process was one of weighing up the opportunities provided by remote assessments with any risks associated with the context of the specific conformity assessment modality being undertaken and the circumstances under which it is being performed. The questions that had to be addressed during the pandemic were:

»   Is it better to do a remote assessment (even when this might not be the ideal methodology), than to do no assessment at all?

»   How can remote assessments be improved to a level of increased trust and integrity of outcomes?

2.2 UNDERSTANDING THE RISKS

The implications of NOT conducting scheduled conformity assessment activities such as surveillance audits might mean that any associated certification or approvals would have to be suspended or withdrawn. Although there was some relaxation of traditional "rules" (such as the criteria defined by the IAF and ILAC, as well as by some scheme owners and regulators), the considerations involved in making such a decision were very different for:

»   A simple manufacturing facility producing non-critical products (or with low environmental impacts, or non-hazardous facilities) whose management system has been certified for a number of years, and with a demonstrated good consistent level of conformity

    OR

»   A highly critical manufacturer of components for the aerospace industry, a healthcare service provider or a nuclear waste reprocessing facility where a number of nonconformities have been detected in recent audits that could have an impact on product safety, human health or the environment

»   Routine accreditation to ISO/IEC 17025 of a well-established calibration laboratory for simple measuring instruments

    OR

»   The initial accreditation to ISO 15189 of a medical laboratory to perform urgently-needed PCR testing for the COVID-19 virus

It would therefore be impossible to define a single, simple algorithm to facilitate these decisions. Each has to be considered individually based primarily on the context and a robust risk assessment of the activities to be performed.

Also, it is important to supplement such a risk-based approach with the use of the "Plan-Do-Check-Act" cycle in which a post-assessment review/critique is made:

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[6]Sources – UNIDO EGM on Remote Assessments, June 2021 and IAF/ILAC/ISO Survey - https://iaf.nu/en/news/use-of-remote-techniques-supported-by-iaf-ilac-iso-survey/

» Were the objectives of the assessment achieved with a good level of confidence?

» What went well?

» Difficulties encountered

» What needs to be improved next time? (NOTE: this includes assessments of other organizations; not only for the next assessment of the same client)

» Feedback into planning of subsequent assessments

2.3
CHALLENGES AND HOW TO OVERCOME THEM

As we have already seen, there are very significant benefits to be achieved by using remote assessments, but that is not to say that their implementation is without challenges, particularly in developing countries. In this section, we look at those challenges and how they can be overcome.

EXAMPLES OF CHALLENGES THAT NEED TO BE OVERCOME

» Access to the appropriate technology (particularly in some sectors and economies)

» Resistance to fully embracing technology by assessor, industry and organizations

» Lack of infrastructure and bandwidth in some regions and/or parts of the client

» Power outages in some areas (countries and/or regions)

» Overcoming concerns about data security (from the client and others)

» Underestimating the effort and time involved in remote assessments

» Assessing in situations in which dependence upon tactile or sensory interaction is key

» Fatigue of assessors and auditees due to the intensity of remote activities

» Time zone differences

» Recruitment and retention of tech-savvy assessors

» Long-term commitment by assessors to continued learning/growth in the use of technology

» Need for significant investments in training

» Permission for remote access refused by public authorities, client or scheme owner

» Confidentiality, security and data protection issues with ICT-based exchange and sharing (e.g. consent by both sides, relevant legislation regarding recording)

We can cluster the challenges into four key areas:

i. **Technology and infrastructure.** While many new technologies, platforms and devices are becoming easier to access and use, realizing how a specific technology can contribute to optimizing the end result and integrating it with existing systems and processes can be complex. In addition, ensuring stable internet connectivity at both the assessor and client locations is crucial.

ii. **Data and information.** Information—many times confidential information—flows during any assessment process. In a digital context, ensuring the data is secured at both ends (information/data generators and users), protected, credible and not susceptible to manipulation is critical both during the assessment and after the information has been stored.

iii. **Process.** Remote assessment requires a rethinking and adaptation of the methods to incorporate the desired technologies, improvement and redesign of existing processes and the incorporation of new ones to meet customer and wider societal requirements.

iv. **Organizational culture change.** Using new technologies, though a new process, requires adaptation from the users, improved IT literacy, leadership, teamwork, trust, and emotional intelligence to overcome frustration when the results are not immediately forthcoming.

2.3.1
Technology and infrastructure

Depending on the nature of the assessment and the context in which it is conducted, varying degrees of ICT infrastructure will be necessary, both for the assessor and the organization or person being assessed. The availability of such infrastructure can vary widely, not only from one country to another, but also for specific regions within a country. In some developing countries, it is not uncommon for a stable power supply and internet connections only to be available in the capital city (if at all). This can make even a simple remote meeting challenging.

That is not to say that all developing countries have a poor ICT infrastructure, though in many cases the level of digitalization and IT literacy is much higher than in some developed economies, but there is much greater variation. This needs to be considered when planning any remote assessments, both in terms of their overall feasibility and (if they are considered to be feasible) having contingency/backup plans in place.

Before committing to undertake a remote assessment (in any location—in developing or developed countries), it is good practice to conduct a "trial run" to validate the technologies being used.

TYPICAL TECHNOLOGIES THAT CAN FACILITATE REMOTE ASSESSMENTS

Note – Reference to proprietary technologies should not be taken to imply that these are preferred or better options than others

Document sharing platforms

» The sharing of documents electronically is not new, but this has previously been done by sending (usually PDF copies) by e-mail as part of the audit preparation and planning stage.

» Real-time access to documents (via screen sharing, for example) offers further opportunities but in a remote assessment scenario can still be "guided" by the auditee sharing (or not) documents that are more or less favourable to the audit outcome.

» Allowing the assessor direct remote access to relevant documentation contained within the organization's information systems can provide excellent opportunities to support traditional assessment methods and is probably the most robust method but requires high levels of mutual confidence between the auditor and auditee because of the information security considerations.

Remote access to process control and system information

» This can be used in real-time (during an assessment), or as part of the audit preparation and/or follow-up.

» Providing the assessor with the appropriate protocols (usually with direct access to the auditee's intranet) allows for verification of a whole range of information, including (but not limited to) process capability data, information on process, product, service or system nonconformities and tracking/effectiveness of corrective actions.

Remote meeting and videoconferencing platforms

» These include platforms such as Skype, Zoom, Webex, MS Teams, GoToMeetings and others, typically used in a laptop or desktop environment.

» These are the "traditional" remote auditing techniques with which most assessors will be familiar.

» Their use has become routine for meetings and working from home during the COVID-19 pandemic.

» In the conformity assessment context, such remote meetings need to be carefully planned and managed by the assessor in order for them to be productive.

» They are similar in nature to meetings held physically in a conference room (which may be

"one-on-one" interviews or meetings with multiple participants, such as an opening or closing meeting). In some situations, however (for example conducting worker interviews in a social assessing context), it might not be possible to overcome confidentiality issues between the interviewee and their employer by using these platforms.

» Document sharing is available on most platforms, and can be supplemented by the use of "whiteboard" apps or similar. The assessor needs to be aware that the auditee is normally in charge of what is and what is not shared, and the limitations (in terms of sampling) that this implies.

» These techniques have limited application for real-time observation of processes, products and service delivery.

» Different platforms offer varying levels of information security—the level of confidentiality required (for example in defence, aerospace or other sensitive sectors) might necessitate the exclusion of some options that would be perfectly acceptable for more "run-of-the-mill" situations.

» If limited bandwidth is a problem, the platforms can be used without video, but this limits the amount of non-verbal communication.

Remote real-time video-access to workplaces

» These methodologies using smartphones (WhatsApp, FaceTime and others) have become more popular in recent times and offer a number of features that can be beneficial to the assessor.

» They are normally used in conjunction with a hand-held device (such as a smartphone), giving them portability but offering only a limited field of view and no realistic real-time document sharing capabilities.

» It is important that the assessor is able to "direct" the field of view by providing instructions to the person operating the device at the auditee's premises, and to have a readily accessible plan of the installations that are being assessed.

» The use of earphones by the auditee can be helpful in limiting background noise but can also restrict the ability of the assessor to obtain aural feedback (for example in the context of noise hazards, or in hearing comments made by others "off-camera").

» Safety considerations related to the use of smartphones also need to be taken into account when walking around certain (hazardous) installations.

Virtual reality (VR) headsets, smart glasses or other wearable technologies

» These essentially provide a more sophisticated "3-D" version of real-time video options. A VR system typically includes a head-mounted camera with a microphone, worn by someone at the organization's premises, which delivers video and audio information to the assessor who wears VR glasses.

» The assessor can experience a 3-dimensional virtual image of the installations and can direct the camera operator to focus on the items of interest.

» Whilst the virtual environment minimizes distraction from the real environment, this can have its advantages and disadvantages. The assessor needs to be able to "direct" the camera operator to look at things that are in the assessor's interest and must take care not to be "led" by the auditee.

» Once again, there can be safety concerns for the camera operator, but these are likely to be lower than for more traditional "smartphone" video applications because the operator can pay full attention to his/her surroundings without the need to be looking at a screen.

» One additional sophistication involves the use of "augmented reality" which combines real and virtual components, integrating digital imagery into a user's field of vision.

Drones or remotely operated vehicles

» These can be used to obtain information from hazardous and/or otherwise inaccessible locations.

» Obtaining real time visual and audio information (ranging, for example, from process monitoring in a chemical plant, to the use of child labour in remote farms or plantations).

» Taking samples for subsequent laboratory testing.

» Inspection for potential internal defects on pipelines.

» Real-time monitoring and measurement of (for example) emissions.

» Satellite mapping, which can be used in the sustainability arena to track (for example) deforestation and land-use changes, as well as monitoring long-term sources of illegal crop burning.

2.3.2
Data and Information security

Confidentiality is an important aspect of building trust in conformity assessment processes, even in a traditional (face-to-face) context. When assessments are conducted remotely, additional care has to be taken to ensure that information security and cyber-security issues are planned and managed appropriately (before, during and after the assessment). Once again, the extent of the measures put in place will depend on the context of the assessment and associated risks.

It is important to select appropriate ICT platforms consistent with the risks involved in the assessment being conducted, and taking into consideration the likelihood and potential consequences of a security breach. This includes the possibilities for hacking, introduction of viruses, malicious software or ransomware, as well as "innocent" (unintentional) security breaches caused by poor discipline on the part of the assessor.

Confidentiality can usually be managed when using virtual meeting platforms through additional controls in the platforms themselves and also through the use of other tools alongside the platforms that can be only accessed using secure authentication protocols. It is also important to build awareness among assessors about the additional information security implications of not viewing documents and processes directly, or being in direct face-to-face contact with the auditee. This includes, for example, the use of "screen-shots" that might contain confidential information or the assessor allowing others to overhear confidential information exchanges if, for example, the assessor is in an unsecure (sometimes public) location.

There is a need to manage confidentiality and avoid potential recriminations for the specific auditee being interviewed. Some individuals may (rightly or wrongly) be concerned about the fact that their responses are being recorded and available for subsequent viewing by others in the organization.

In the social assessing context, many confidential "worker interviews" are conducted offsite, so that (at least in principle) their employer should not even be aware of which employees have been interviewed. That would be almost impossible if the employer is providing the meetings platform on which the interviews are conducted. It is important in these situations to ensure that a "neutral" person of trust (independent of the organization) is able to provide a portable device such as a smartphone to facilitate the interviews offsite and ensure that the identities of the interviewees remain confidential as well as the information they share.

In some conformity assessment contexts (for example personnel certification) it is also important to maintain the confidentiality of on-line examination questions to avoid them being shared with other potential candidates, for example, by taking screen-shots during the exam.

2.3.3
Process

PLANNING

It is important to recognize that conducting a remote assessment means much more than just "conducting a 'traditional assessment' remotely". In order to conduct a successful remote assessment significantly more planning is required, as well as a variety of additional assessor skills in addition to simply being familiar with the technologies used. These include the ability to manage and conduct remote meetings, and the need to have a clear prior understanding of the organization's installations and processes (to be able to conduct remote visits and inspections with appropriate sampling). In many cases, experienced assessors will be taken out of their comfort zone, and will need to start over by acting as "trainee assessors" in a remote environment under the guidance of an assessor with more experience in remote assessments. Once again, an evaluation of the risks involved in any specific assessment should be undertaken when selecting the most appropriate assessment team.

It is generally accepted that conducting a remote assessment is not an "easy option" that reduces the overall assessment time. Indeed, significantly increased attention is required in planning remote assessments, and it is often found to be beneficial to break down the assessment plan into "bite-sized chunks" to be conducted over a longer time frame than usual, instead of being concentrated over traditional "eight-hour working days". This change of approach can, however, have implications for the ways in which assessors are engaged and remunerated, with associated challenges that need to be taken into consideration.

SAMPLING

In recent years, remote assessments have provided excellent opportunities to improve sampling at the "macro" level, by facilitating the inclusion of multiple locations with greater ease and at a lower cost.

At the "micro" level, however, there is a risk that the sampling (of individual processes, products, services and personnel, for example) could be more superficial and/or biased, driven by the organization under assessment rather than by the assessor. It is important, therefore, that the assessor has a good prior understanding of the organizational structure, processes, potential interviewees and boundaries before initiating the assessment.

As part of the planning process, both parties should discuss and agree to put the assessor in full control of any initial "walkthrough" of the organization being assessed, for example, by directing cameras and questioning to replicate the experience of an in-person "guided tour".

Where physical sampling is involved (in the inspection or product certification context, for example) the assessor needs to be able to direct someone in the organization to select the samples according to the assessor's criteria, and to ensure appropriate traceability (chain of custody) of the samples taken.

CONDUCTING THE ASSESSMENT

Audits and assessments often rely on assessors assimilating information from multiple sources simultaneously. This includes what is often referred to as the assessor's "sixth sense" and an awareness of what is going on around them. This might include, for example, observing the ease with which the organization is able to access relevant documents; frantic activity and/or conversations in the background; body language of those involved in the assessment (not only the specific person being interviewed at a particular time); sense of smell; touch; temperature; air flow; sound; depth perceptions; and so on. These can be extremely important when conducting (for example) Food Safety, Environmental or Occupational Health and Safety audits.

This means that it can be difficult to assess long or complex processes or situations remotely from the "key hole" perspective of a single access point (resulting in a relatively small field of vision and a lack of immersion in the overall scene). Some of the more sophisticated remote assessment tools such as VR and AR can partially overcome some of the issues, but nevertheless there are likely to be situations in which a full remote assessment is not feasible, and a "hybrid" approach is needed (part remote; part on-site).

It is also important to control the overall number of people who are participating in an assessment at any one time. On one hand this can be beneficial (in terms of engagement, learning experience for those involved and increased sampling possibilities), but on the other hand this can also result in distractions and inefficient use of time "just because" the technology allows it.

There is also a danger (for example in a management system or product certification context) that the auditor will concentrate too much only on documentation (which is relatively easy to audit remotely) rather than observing the organization's processes.

SOURCES OF GUIDANCE ON CONDUCTING REMOTE ASSESSMENTS

Many of the standards and guides that are currently available on remote assessments have been developed within the management system certification arena, but they can also provide useful information with a broader application to other conformity assessment modalities (subject to appropriate modifications). Some examples include the following:

» **IAF ID3:2011 "Management of Extraordinary Events or Circumstances Affecting ABs, CABs and Certified Organizations"**

   » Addresses a circumstance beyond the control of the organization.

   » Applies to affected ABs, CBs and/or certified organizations.

   » Based on an assessment of the risks of continuing certification.

   » Defines alternate potential short-term methods of assessing the organization to verify continuing effectiveness of its management system.

» **IAF MD 4:2018 Mandatory Document "Use of ICT for Auditing/Assessment Purposes"**

   » This latest version of MD4 clarifies that all requirements, including those involving the observation of auditee processes and activities, can be audited remotely.

   » It includes the need to:

      § Verify that the appropriate technological infrastructure is in place.

      § Ensure that auditors and audit clients are competent to use the technology.

      § Consider security / confidentiality needs.

      § Take into consideration that additional planning may be necessary, which could impact audit duration.

» **ISO 19011:2018 – "Guidance on Auditing Management Systems". Annex A16 includes extensive guidance on the use of remote auditing**

   » Ensuring the audit team is using agreed remote access protocols, including requested devices and software.

   » Conducting technical checks ahead of the audit to resolve technical issues.

   » Ensuring contingency plans are available and communicated (e.g. interruption of access, use of alternative technology), including provision for extra audit time if necessary.

   » Ensuring auditors have the technical skills to use appropriate electronic equipment and other technology while auditing, and experience in facilitating meetings virtually to conduct the audit remotely.

» **IAF ID 12:2015 "Principles on Remote Assessment" provides further information and guidance on the principles of assessment of CABs by ABs (including remote witness assessments).**

» **ISEAL Alliance Remote Auditing Good Practices v1.0 (June 2021) provides examples of good practice in particular for the Social and Environmental auditing arena.**

Furthermore, the core content of many of the CASCO standards are very similar which facilitates the broader application of any remote assessment guidance or documents to the other conformity assessment modalities.

A more extensive bibliography is provided in Annex I.

2.3.4
Organizational culture change and competence issues

ABILITY OF ASSESSORS TO ADAPT TO REMOTE ASSESSMENTS

This was a constant cause of concern during the early stages of the COVID-19 pandemic, and assessor competence continues to be an important factor in planning remote assessments, particularly in developing countries where the technologies involved are not as widespread or readily available to assessors. In order for technology, data and processes to work harmoniously, remote assessments require talented people with skills, competences and educational backgrounds that are fit for purpose. Organizations need to adapt and allow for sufficient resources to build the capacity required to conduct remote assessments.

Conformity assessment has undergone a significant transformation over the last two decades, and most (but not necessarily ALL) assessors are now reasonably comfortable using electronic documents and records rather than "hard copies" which were commonly used during the last century. It is not uncommon, however, to find such "digitalization" being limited to assessors accessing or receiving by e-mail PDF copies of the documentation on which to base their face-to-face inspection or assessment (and then sometimes printing this out).

Although some assessors operating in "high-tech" sectors were already very familiar with many of the technologies mentioned in Section 2, a significant number of those involved in conformity assessment (both in terms of the assessor and the organization or individual being assessed) had a very steep learning curve in early 2020 at the beginning of the COVID-19 pandemic. This meant that a large amount of information was published in a short space of time, and assessors in developing countries were often faced with an information overload, describing

useful experiences and good practices in a whole variety of conformity assessment situations that were not feasible or relevant for their specific context.

Whilst local branches of multinational conformity assessment bodies in developing countries undoubtedly benefit from the technologies and experiences of their colleagues in developed countries and high-tech sectors, there continues to be an urgent need for practical, pragmatic capacity-building and the mentoring of local assessors in remote assessment in less-developed economies. Furthermore, as local branches of multinationals are not exempt from structural problems in a developing country, they will experience the same problems as national bodies to a large degree.

ASSESSOR/"AUDITEE" FATIGUE

Many forms of conformity assessment can be very intense (even in a traditional face-to-face environment), with the auditor having to access and process many sources of information simultaneously, often within a complex system that s/he is seeing for the first time. It is important to recognize when planning a remote assessment that this can add to the intensity, and it might not always be feasible or desirable to plan a series of traditional "eight-hour days". Instead, it might be appropriate to prepare an assessment plan that breaks the schedule down into smaller "bite-sized chunks" over a longer period of time.

Remote assessment has also had both positive and negative implications regarding travel. In a traditional scenario, the team of assessors travelled to the organization to conduct the assessment. This involves both travel time, costs (in terms of the travel itself and the assessor's travel time) and often the need for the assessor to adapt to significant changes in time zones. Whilst the move to remote assessments largely eliminates these inconveniences associated with travel, it does often mean that the assessor is working unusual hours, based on the organization's time zone, and this can add to overall assessor fatigue. Once again, it might be appropriate in these situations to break the assessment down into smaller blocks (if possible, at a time that is convenient to both parties), to be conducted over a longer overall assessment period.

HOW TO OVERCOME THE CHALLENGES (SOME EXAMPLES)

» Risk evaluations to determine when best to use remote or face-to-face assessment (or a blended approach of both)

» Invest time in detailed planning and preparation of the assessment

» Take into consideration past performance results when planning the assessment

» Spend time ahead of assessment preparing and testing/validating ICT

» Identify data and security issues ahead of time; any relevant regulations

» Use of a dry-run technology test in the same environment to allow for simulation/validation

» Use of VR or AR technologies to overcome limited field of view in traditional video or smartphone images

» Ensure the client has the necessary technology available and all documentation in digital form

» Have back-up plans (support tools, additional technology to fill-in if there are problems)

» Include an evaluation of the effectiveness of ICT in the assessment report (Plan-Do-Check-Act)

THINGS TO AVOID

» Attempting "business as usual" and trying to conduct remote assessments using a traditional assessment mentality

» Not having an agreed set of common rules for conducting remote assessments

» Not allowing sufficient time for the client to prepare

» Allowing the client to control the assessment (sampling, timings, etc.)

» Relying on pre-recorded images or pre-selected documentation

» Use of speakers instead of headphones (too much background noise)

» Poor bilateral communications, resulting in tension and frustration for all concerned

3. Opportunities and challenges for different conformity assessment modalities

Whilst there are many commonalities between the various different forms of conformity assessment, there are also considerations that are specific to each modality. These will now be discussed in more detail.

MANAGEMENT SYSTEMS CERTIFICATION

In the management system arena, real-time remote access to process information, together with big data analysis, electronic meeting capabilities, interviews of employees at remote locations using ICT and other new technologies provide more efficient ways of auditing conformity to management system standards.

There are currently over 40 such standards within the ISO portfolio alone, most of which can be subjected to third party accredited certification. These include:

WELL-ESTABLISHED STANDARDS SUCH AS:

- » ISO 9001 (Quality management)
- » ISO 14001 (Environmental management)
- » ISO 45001 (Health and safety management; formerly OHSAS 18001)
- » ISO/IEC 27001 (Information security management)
- » ISO 22000 (Food safety management)

NEWER STANDARDS SUCH AS:

- » ISO 21001 (Educational organization management)
- » ISO 21401 (Sustainable accommodation management)
- » ISO 30401 (Knowledge management)
- » ISO 37001 (Anti-bribery management)
- » ISO 37301 (Compliance management)

- » ISO 39001 (Road traffic safety management)
- » ISO 41001 (Facility management)
- » ISO 50001 (Energy management)
- » ISO 55001 (Asset management)

STANDARDS UNDER DEVELOPMENT:

- » ISO/IEC 42001 (Artificial intelligence management)
- » ISO 56001 (Innovation management)

Each of these standards presents unique opportunities and challenges for the use of remote auditing techniques, and their feasibility, application and effectiveness are likely to be very different depending on the specific contexts in which they are utilized. As mentioned previously, it is vital to use a risk-based approach to determine the most appropriate "blend" of traditional and remote auditing techniques. Depending on the individual circumstances, this could range from 0–100%.

Assessment (in this case audits) to all these standards are, however, subject to the following requirements and guidelines:

- » ISO/IEC 17021-1 (Conformity assessment — Requirements for bodies providing audit and certification of management systems — Part 1: Requirements) which mentions that " *'On-site' audits can include remote access to electronic site(s) that contain(s) information that is relevant to the audit of the management system. Consideration can also be given to the use of electronic means for conducting audits.*"[7]

- » ISO/IEC 17021-"x" for discipline-specific conformity assessment requirements, as well as other requirements documents (usually numbered as ISO xx003) developed in collaboration between ISO/CASCO and the Committee responsible for the respective management system standard. One example is ISO/TS 22003 (Food safety management systems — Requirements for bodies providing audit and certification of food safety management systems).

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[7] ISO/IEC 17021-1:2015 NOTE to Clause 9.4.1

» ISO 19011 (Guidelines for auditing management systems) which includes comprehensive guidance on remote auditing throughout the standard, and specifically in its Annexes A1, A15 and A16. Some relevant extracts from the standard are as follows:[8]

  » "Audits can be performed on-site, remotely or as a combination. The use of these methods should be suitably balanced, based on, among others, consideration of associated risks and opportunities."

  » "The feasibility of remote audit activities can depend on several factors (e.g. the level of risk to achieving the audit objectives, the level of confidence between auditor and auditee's personnel and regulatory requirements)."

  » "At the level of the audit programme, it should be ensured that the use of remote and on-site application of audit methods is suitable and balanced, in order to ensure satisfactory achievement of audit programme objectives."

» IAF Mandatory Documents ("MD" series), and in particular IAF MD4 ("IAF Mandatory Document for the use of Information and Communication Technology (ICT) for auditing/assessment purposes").

» Applicable requirements of sector schemes such as in those based on ISO 9001 in the Automotive, Aerospace, Telecommunications and Oil and Gas sectors, and Food Safety (product and/or system) certification schemes that are recognized by the Global Food Safety Initiative (GFSI).

» Applicable regulatory requirements (for example those in the medical devices sector that are based on ISO 13485).

Flexibility has been built into certain of the above requirements. There may be reason to review these requirements in light of the real possibility of more pandemics in the future (the "new normal").

Many organizations are sharing their lessons learned and resources are available and continue to be made available including:

» UKAS Publication TPS74 on Blended Audits: https://www.ukas.com/wp-content/uploads/2021/06/TPS-74-Guidance-on-a-blended-approach-to-auditing-of-MS.pdf

» From BSI: https://www.bsigroup.com/en-GB/our-services/immersive-technology-solutions/

» From ISO/CASCO: https://www.iso.org/ca-covid19.html

» ISO/IAF Auditing Practices Group white paper: https://committee.iso.org/files/live/sites/tc176/files/documents/ISO%209001%20Auditing%20Practices%20Group%20docs/Auditing%20General/APG-Remote_Audits.pdf

PRODUCT CERTIFICATION

Product certification typically includes several conformity assessment activities such as testing, measuring, inspection, design verification/validation, assessment of services and processes and auditing to provide information regarding the product requirements. There are a number of different scheme types involved in product certification,[9] and the implications of the use of remote assessments are different for each of these.

Accredited product certification bodies are required to conform to ISO/IEC 17065:2012, which makes no mention of the use of remote assessment techniques (in favour or against).

Because of the nature of product certification (particularly when sensory information is necessary such as for certain food safety schemes), full remote assessment is not always an option and a blended approach can be particularly beneficial.

PERSONNEL CERTIFICATION

Personnel certification is a form of conformity assessment aimed at providing attestations of the competence of an individual to carry out certain activities. In this respect, it is important to emphasize the definition of competence provided by ISO 9000:2015[10] —"the ability to apply knowledge and skills to achieve intended results".

Personnel certification typically involves the assessment of a large number of individuals instead of organizations, with little possibility for sampling (other than in the selection of examination questions, for example).

For the evaluation of practical skills, the use of remote assessments provides significant opportunities. These include the ability to observe remotely the practical skills of professionals such as welders, inspectors, auditors and forklift truck drivers without the need for them to travel to specific test centres.

One of the key challenges that has always been an issue in personnel certification, however, relates to the assessment of knowledge, and to ensuring that the person who is taking an examination is doing so without outside assistance. It is only in recent years that the technologies have become available to provide confidence in this respect.

Some additional benefits of remote assessments that are particularly relevant for personnel certification include:

» Avoiding the need for candidates to travel to test centres

» Improved inclusivity for persons with disabilities

» Possibility to provide digital badges (with metadata confirmation of a certificate)

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[8] ISO 19011:2018 Clauses 5.5.3; Annex A1

[9] See ISO/IEC 17067:2013 (Conformity assessment — Fundamentals of product certification and guidelines for product certification schemes)

[10] ISO 9000:2015 "Quality management systems - Fundamentals and vocabulary"

» Exploring new technologies (AI, simulations, innovative advanced test questions)

Some specific challenges for personnel certification include:

» Identity verification

» Remote monitoring to avoid the potential for cheating (receiving off-screen help with answers)

» Maintaining IP for test questions (avoiding screen-shots for subsequent sharing)

» Ensuring a balance between testing candidates' theoretical knowledge and practical skills

CERTIFICATION TO VOLUNTARY SUSTAINABILITY STANDARDS AND ORGANIC CERTIFICATION

Although these two modalities share many similarities with both management system certification (in particular quality, environmental and health and safety management systems) and product certification (on which some Voluntary Sustainability Standards, VSS, and Organic certification schemes are based), they are treated differently in this document for several reasons:

» The very nature of VSS and Organic auditing brings a number of challenges even in a physical audit situation, and transparency issues (including data falsification) is an ongoing problem in some regions and sectors. This has led to the widespread utilization of "surprise audits" (which are not common in other assessment modalities), which can pose challenges for remote assessment.

» There are a number of cultural and behavioural factors that can need special attention when remote assessments are being considered. This includes the need for heightened confidentiality for individual auditees, to avoid potential recriminations.

» VSS include a whole range of certification and accreditation schemes, primarily in the social and environmental auditing arena, most of which operate independently of the accreditation structure provided by the IAF. Recent years have, however, seen increased collaboration between the VSS scheme owners/accreditation bodies and the IAF, with some alignment in approaches becoming more apparent.

Whilst some CABs limit their activities to VSS and/or Organic certification, others are involved in a wide portfolio of activities including inspection, management system or product certification activities. Some of the key actors in the VSS space include:

» ISEAL Alliance, a "global membership organisation that promotes ambitious collaborative and transparent sustainability systems".[11] ISEAL provides a platform for sharing its Codes of Good Practice that include its:

» Standard-setting Code – that defines how a VSS should be developed, structured and improved over time.

» Assurance Code – that provides a framework for assessing compliance with standards, so that consumers, supply chain partners, investors and other stakeholders know they can trust the results of assessments.

» Impacts Code – that supports robust monitoring and evaluation that helps systems to understand how effective their standards are in achieving what they set out to do.

In 2021, ISEAL published a Guide on Remote Auditing Good Practices[12] that shares its members' experiences including but not limited to those obtained during the COVID-19 pandemic.

» Accreditation bodies such as Assurance Services International (ASI); Social Accountability Accreditation Service (SAAS; part of Social Accountability International); Worldwide Responsible Accredited Production (WRAP); and International Organic Accreditation Service (IOAS; now including VSS accreditation).

» Standards and/or Scheme Owners such as Fairtrade International; Forest Stewardship Council (FSC); Marine Stewardship Council (MSC); Rainforest Alliance (RFA); and 4C Services.

» Conformity Assessment Bodies that conduct audits on behalf of the above schemes.

Since many of these certifications are focused on the agricultural sector, it is common for conformity assessment bodies to also provide Organic certification as part of a "one-stop shop" approach, though in this case such certification is usually subject to national or regional regulation.

Some additional benefits of remote techniques that are particularly relevant for VSS and Organic certification include:

» The use of remote sensing or satellite technology that can be used to detect land use change, deforestation, etc.

» Use of drones can detect hidden use of child labour; forced labour; and environmental emissions

Additional challenges that need to be overcome (but which in some cases cannot be overcome by using remote techniques) include:

» How to assess social issues that are not readily apparent without using the auditor's "sixth sense"

» Difficulty to conduct "surprise audits" or audits at short notice

» Taking appropriate samples (e.g. for pesticides; potable water supply) needs to be done on-site

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[11] See https://www.isealalliance.org/

[12] See https://www.isealalliance.org/about-iseal/our-work/remote-auditing

INSPECTION AND TESTING

Although inspection traditionally relies on the physical presence of an inspector to conduct or witness sampling and testing, the use of remote assessment methodologies is gaining momentum, accelerated of course by the COVID-19 pandemic. Remote activities can complement or even substitute the evidence gathering activities on-site including, for example, examination and evaluations using remote digital imaging technologies and/or sampling by means of a proxy. This is nothing new—remotely operated vehicles (ROVs) have been widely used as an underwater inspection tool for offshore structures for many decades, and the so-called "intelligent pigs" inserted into high-pressure gas pipelines can conduct wall-thickness measurements as well as sophisticated non-destructive testing many kilometers from the operator.

In the laboratory context, it has become increasingly common in recent years for the evaluation of test results to be outsourced (using digital techniques to transfer data and images across continents) or performed by the use of artificial intelligence to identify features or anomalies that may escape human detection.

It is now becoming increasingly commonplace for sampling and testing to be conducted by remotely operated means on different planets—so the technology exists, it just needs to be used and accepted more widely. In order for that to happen, it is important to ensure trust in any activities (such as sampling) or interfaces that include the organization whose products or services are the object of inspection or testing. A form of "remote assessment" that has become very well-known to international travellers during the COVID-19 pandemic is the home-based PCR testing that relies heavily on trust—that the person is collecting their own sample, and not substituting it by a sample taken from another person.

The main conformity assessment standards that are relevant in the inspection and testing arena are:

» ISO/IEC 17020 (Conformity assessment — Requirements for the operation of various types of bodies performing inspection)

» ISO/IEC 17025 (General requirements for the competence of testing and calibration laboratories)

» ISO 15189 (Medical laboratories — Requirements for quality and competence)

None of these standards mention the use of remote assessment techniques (in favour or against).

Some additional benefits of remote techniques that are particularly relevant for inspection and testing include:

» Increased flexibility; valid alternative for inspections and testing where there are problems with general access

» Ability to conduct inspections, sampling and evaluations remotely in non-hazardous and more ergonomically suitable environments

» Inspection and testing capabilities can be enhanced (for example by using AR devices)

» Drones can be equipped with multispectral sensors for precise measurements in agriculture and other areas

» ROVs can be equipped with sophisticated tools for taking samples, making measurements or transmitting data for real-time or subsequent examination by imaging technologies

Additional challenges that need to be overcome (but which in some cases cannot be overcome by using remote techniques) include:

» Remote inspections for some time-sensitive activities are not always possible (e.g. food) or if a physical examination is required (e.g. for installations)

» Not all conditions can be experienced remotely (e.g. those involving smell, taste)

» Difficulties in authentication (e.g. of persons and documents)

ACCREDITATION AND PEER ASSESSMENTS

Accreditation of CABs by accreditation bodies operating under the ILAC/IAF umbrella includes:

» Management System certification bodies (ISO/IEC 17021-1)

» Product certification bodies (ISO/IEC 17065)

» Inspection bodies (ISO/IEC 17020)

» Personnel certification bodies (ISO/IEC 17024)

» Testing and calibration laboratories (ISO/IEC 17025)

» Medical laboratories (ISO 15189)

» Validation/verification bodies (ISO/IEC 17029)

» Proficiency testing bodies (ISO/IEC 17043)

» Materials producers (ISO 17034)

IAF ID 12:2015 "Principles on Remote Assessment" provides further information and guidance on the assessment of CABs by ABs (including remote witness assessments).

Peer assessments have much in common with accreditation assessments, and have been used for many years as a means of deciding upon whom to admit to a particular group of equals or peers. In the field of conformity assessment, groups of bodies conducting the same type of work, for example, testing or accreditation, have used peer assessment in order that the work of each body can be assessed and found acceptable to all the other bodies. Peer assessments form an integral part of the ILAC and IAF multilateral recognition arrangements, based on ISO/IEC 17011, as well as for some CAB associations such as IQNet and IECQ who conduct peer assessments among their members.

Requirements for peer assessments are defined in ISO/IEC 17040:2005 (Conformity assessment — General

requirements for peer assessment of conformity assessment bodies and accreditation bodies).

Some additional benefits of remote techniques that are particularly relevant for accreditation and peer assessments include:

» Facilitates more robust sampling (in terms of people and organization sites)

» Flexibility to include subject matter experts in the team for parts of the assessment

Additional challenges that need to be overcome include:

» Lack of availability of competent personnel on behalf of the CAB's client

» Difficulties in conducting remote witness assessments of non-remote assessments

» The need for three parties to agree on remote access protocols and have the appropriate technology for witness assessments (the AB, the CAB and the client)

» Need to convince some regulators and scheme owners to accept the results of remote assessments

4. The future for remote assessments

The common phrase that is used to refer to the "post-COVID" era is "the new normal", and this applies very well to conformity assessment. For most CABs and ABs, the default methodology before 2019 was physical "face-to-face" assessment, with some remote techniques being adopted as appropriate. During the COVID-19 pandemic, however, the use of remote assessment became a necessity, with many economies facing severe travel restrictions and social distancing rules. To provide continuity in conformity assessment activities in these circumstances, site visits and other face-to-face activities were used only when strictly necessary, and often had to be postponed.
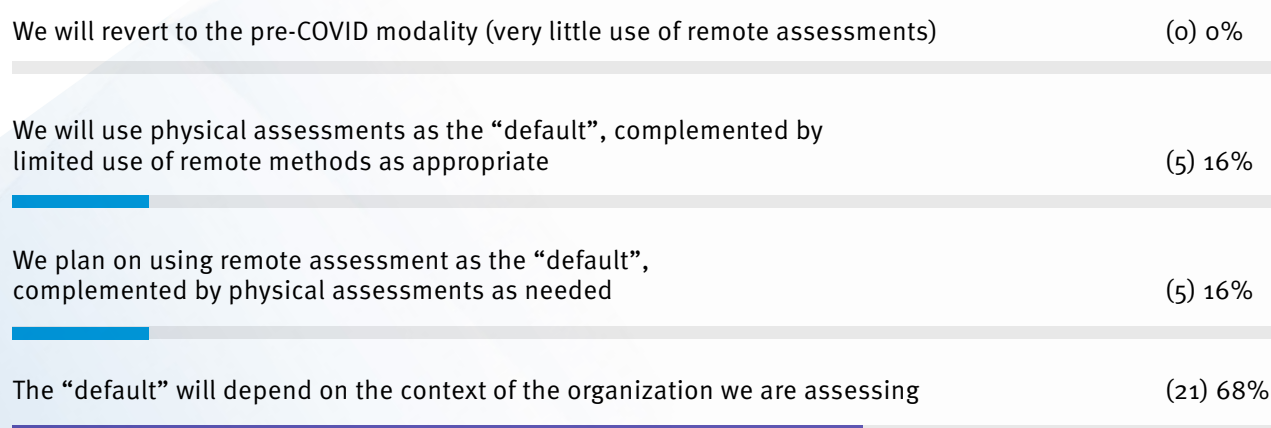
It is, however, important to look beyond the specific circumstances imposed by the pandemic, and to view remote assessment in terms of the overall digital transformation of economies in general and Quality Infrastructure/conformity assessment activities in particular. In order to be successful, this requires interrelated areas to work together harmoniously, taking into consideration the implications of technology, data management, processes and the associated organizational culture change that is needed.

There is general agreement within the conformity assessment community that things will never be the same again, and the experiences that have been learned from the "enforced" use of remote assessments during the pandemic will provide significant opportunities for their further utilization in the future. This does not mean that remote assessments will necessarily become the default modality, but they will certainly play a much wider role within a "hybrid" or "blended" approach to conformity assessment that leverages the benefits of both remote and physical assessments to achieve the optimum outcomes.

Figure 1 shows the responses of the participants of the EGM in this respect:

FIGURE 1: **HOW DO YOU SEE THE FUTURE OF REMOTE ASSESSMENTS?**

We will revert to the pre-COVID modality (very little use of remote assessments) — (0) 0%

We will use physical assessments as the "default", complemented by limited use of remote methods as appropriate — (5) 16%

We plan on using remote assessment as the "default", complemented by physical assessments as needed — (5) 16%

The "default" will depend on the context of the organization we are assessing — (21) 68%

This is in good agreement with the results obtained during the IAF/ILAC/ISO survey[13] (from over 4000 respondents, largely from developed economies) shown in Figure YY.

21% Traditional on-site audits/assessments/evaluations with a physical presence on-site

60% Blended audit, where parts are done with physically on-site and parts are conducted remotely

19% Fully remote audit/assessment/evaluation with connection via digital tools
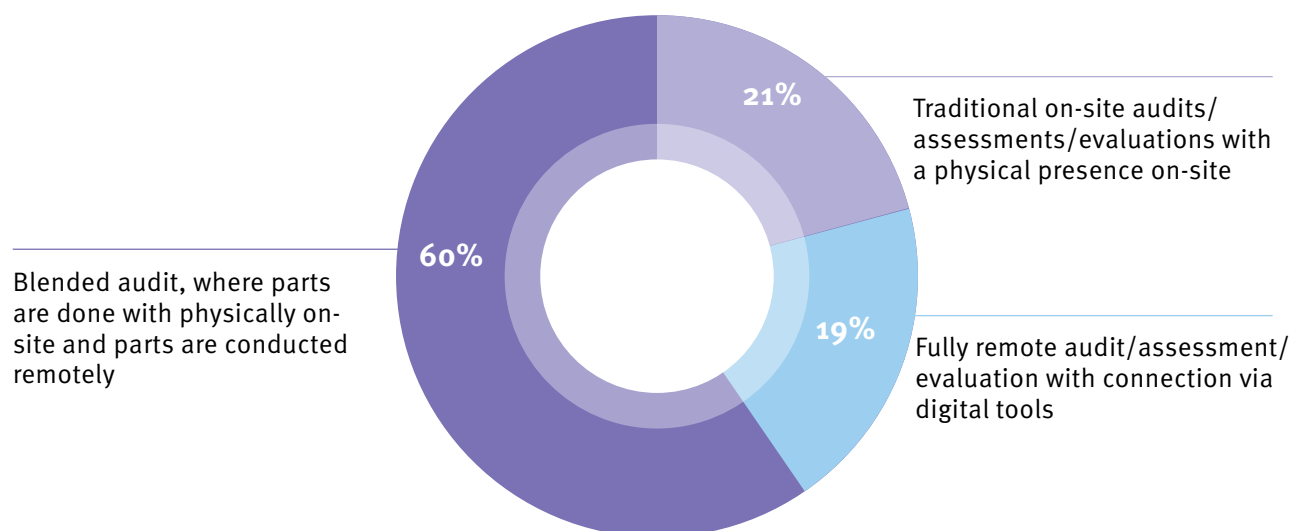
The following is an extract from the recently-published UKAS TPS 74 document "Guidance on the use of a blended approach to auditing of management systems by certification bodies" that could be extrapolated to apply to other forms of conformity assessment:

"The intention of this document is to build upon and adapt the lessons learned during the coronavirus pandemic into a more normal working environment, defining a framework for the provision of a blended approach to auditing that ensures the same level of confidence in accredited management system certification, whilst realising a more sustainable and flexible approach to its delivery.

To ensure the continued integrity of management system certification, the certification process must be completed in a competent, thorough, and transparent manner. Therefore, it is important to ensure that the output of any audit process must be, through evidence, proven as effective as traditional techniques and meets the requirements of the standards/schemes."

Such a "blended" approach and the digitalization of the global economy continues through the use of the methodologies described in this publication, as well as other emerging technologies such as artificial intelligence, big data analysis, predictive analytics and blockchain. These will provide additional opportunities not only to rethink the ways in which conformity assessment activities are provided, but also to make them more cost-effective and at the same time more robust in their outcomes.

It is important to emphasize, however, that the use of remote assessment, as with any kind of remote working, does not rely exclusively on technology. It requires a complete re-think of the way things have traditionally been done. It is not enough to do things "online"—in order to do that, the whole process, priorities, and applicable standards and procedures might need to be reconsidered to achieve the same output (including the use of methodologies, software and tools that were previously not considered or needed). In short, there is a need to embrace the latest thinking in terms of what is rapidly becoming known as "Quality 4.0" for which the working definition proposed by the UK's Chartered Quality Institute is "the leveraging of technology with people to improve the quality of an organization, its products, its services and the outcomes it creates".[14]

Digitalization, big data and artificial intelligence—among other emerging technologies—mean that companies can monitor processes, collect data in real time and apply predictive analytics to determine product quality issues, epidemiological problems and consumer trends ahead of time. Digital tools also enable people to do their jobs faster, better and at reduced cost, and standards can help to support this.

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[13]   IAF/ILAC/ISO   Survey   https://iaf.nu/en/news/use-of-remote-techniques-supported-by-iaf-ilac-iso-survey/

[14] Quality World, Summer 2021, p 25–34; https://www.quality.org/file/23870/download

SOME COMMENTS FROM EXPERTS IN THE UNIDO EGM ABOUT THE FUTURE OF REMOTE ASSESSMENTS:

» Remote assessments are the future, and will prevail after COVID-19

» The use of a "blended approach" could evolve to provide digital assurance through the use of predictive methods, artificial intelligence, etc.

» It will be important to define mechanisms and criteria to recognize which methodology is the most appropriate for the various components of an assessment

» We can foresee accelerated and increased concerns impacting the demographics/skill set on future auditor/assessor resource availability

    » Aging demographic of auditors/assessors

    » Increased digitalization requires different competence

    » Need to stimulate ongoing commitments to growth/learning

» CABs will need to conduct risk evaluations to determine when best to use remote assessment or on-site assessing (or a combination of both)

» Witnessing and sampling still poses challenges in remote assessing and will need to be further explored for use with remote evaluation

» Audit durations are about the same for physical and remote audits but we can expect to spend more time on planning and the use of technology (including training)

» Assessment reports should include the effectiveness of ICT—what worked and what did not

» The use of remote assessments can make a significant contribution to reduce carbon footprints

» Need to go back to some on-site assessments (blended approach)

» Need to be conscious of the possibility that remote assessment can become discriminatory (favouring the more educated sectors in developed economies)

» Stronger, data-oriented, objective, transparent risk assessment will be the key to eliminate fraud (including unfair competition among CABs)

» Need to avoid remote assessments becoming "tick-box" audits focusing only on documentation

» ABs and CABs will need to demonstrate their competence in the new methodologies

5. Conclusions and recommended next steps

The global disruptions arising from the COVID-19 pandemic have had a greater impact on digital transformation than was seen over the last two decades, and injected an urgency into the adoption of new technologies. Nowhere has this been more apparent than in the conformity assessment arena, where the use of remote assessment techniques to ensure the continuity of conformity assessment and confidence in its outcomes became a strategic imperative.

A number of currently-available remote assessment tools (including remote meetings, remote access to process information and documentation, smartphones, VR and AR devices and others) were rapidly deployed and their use has now become commonplace (particularly in developed economies). Emerging technologies will be further deployed in future to provide enhanced levels of confidence in conformity assessment by using a blended approach to the use of physical and remote assessment methodologies.

Developing countries need to stay abreast of the latest developments and ensure that they are not left behind in this increasingly digitalized world of conformity assessment. Some pragmatic steps they can take include the following:

» Learn about and embrace the new digital technologies that are now available to enhance traditional assessment methodologies

» Adopt risk-based thinking to decide the best mix of methodologies for specific conformity assessment contexts as part of blended assessment approach

» Choose the most appropriate methodologies for the context in which you operate (taking into account the availability of adequate ICT infrastructure), rather than just "using the latest trendy tools"

» Learn from the experiences (including successes and failures) of peers in other countries and/or conformity assessment modalities

  » From examples that have been shared in this publication

  » From the extensive bibliography that is now available (see Annex I)

  » By engaging with professionals and organizations in international and regional fora

» Rethink the entire assessment process to obtain maximum benefit from remote assessments as part of the "bigger digitalization picture"

» Start with the "low-hanging fruit" and learn by doing—for example by conducting pilots in less critical areas of conformity assessment activity (including, for example, internal assessments)

» Recognize that some assessors will be taken out of their comfort zone and will need extensive training, support and reassurance if they are to take advantage of these technologies to their full extent

ANNEX I
Bibliography and Additional Resources

The following is a non-exhaustive list of freely-accessible publications:

»   https://www.theauditoronline.com/remote-auditing-an-iso-9001-auditors-perspective/

»   https://www.thefdagroup.com/blog/remote-auditing-best-practices-checklist

»   https://www.bsigroup.com/en-GB/our-services/certification/remote-audit/

»   https://certification.bureauveritas.com/newsroom/remote-auditing-solution-bureau-veritas

»   https://www.quality.org/knowledge/remoteassessments

»   https://www.ukas.com/coronavirus/remote-assessments/

»   https://www.scc.ca/en/en/accreditation/get-accredited/remote-assessment

»   https://www.iasonline.org/wp-content/uploads/2020/04/IAS_ADM_063-IAS-Guide-on-Remote-Assessments-for-CABs-20200317.pdf

»   https://www.sadcas.org/sites/default/files/pdf-documents/SADCAS%20AP%2023%20-%20%20Remote%20Assessments-%20Management%20and%20Execution%20[Issue%202].pdf

»   https://tii.unido.org/news/remote-assessment-and-auditing-amid-covid-19-outbreak

»   https://anab.ansi.org/training/remote-assessments-lab-related-programs-webinar

»   https://www.a2la.org/covid-19

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