Environmental management systems in the architecture, engineering and construction sectors

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ABSTRACT

Implementing and using environmental management systems (EMS) in the architecture, engineering, and construction (AEC) sectors has received worldwide attention but never through a phenomenological lens. This study investigates the *'lived-experiences'* of experts who have implemented and used ISO14001 in AEC organisations based in the UK. Using a qualitative research strategy of semi-structured interviews, extensive analysis of the conversations reveals several themes, namely: participants believe ISO14001 is not just an environmental business tool, ISO14001 offers a means for delivering sustainability, ISO14001 accreditation opens doors for business accruement, and, moreover, ISO14001 is more than a badge, rather it is a modern-day business necessity. The study also reveals that not all those organisations asking for ISO14001 have the accreditation themselves. Based on this evidence, and contrary to previous studies that have proposed EMS are chiefly implemented to save costs and comply with legislation, it seems box-ticking as part of a tendering process is now the major motivation for organisations to attain and maintain ISO accreditation. Further, concerns are expressed that some organisations are unwilling to state their sustainability objectives or embed their operations within an EMS that will be audited because it could emphasise their poor performance to stakeholders.

KEYWORDS: Environmental impact, Sustainability, EMS, ISO14001, Business performance

INTRODUCTION

Environmental management systems (EMSs) were originally instigated to encourage organisations to manage their environmental impacts (Horry and Booth, 2019). There are many EMSs available worldwide (e.g., EMAS, ISO14001, amongst others), adopted across many industries and sectors (e.g., manufacturing (Jannah *et al.,* 2020), retail (Naidoo and Fasparatos, 2018), hospitality (Achmad and Yulianah, 2022), amongst others). Their uptake by the Architecture, Engineering and Construction (AEC) sectors is hugely important because these sectors are notable for their potential detrimental environment impacts (e.g., consumption of virgin resources, wasteful design and build practices, excessive high energy uses, amongst others) (Gomes *et al.,* 2023).

Implementing systems to manage environmental impacts can be traced back to BS7750 (published in 1992) (Dzakhmisheva *et al.,* 2022), a forerunner to the now widely adopted ISO14001. ISO14001, created in 1996 and updated in 2004 and 2015 (Ferreira *et al.,* 2019), is a multi-purpose system that helps organisations reduce negative impacts on the environment, prevent pollution, and continually improve their environmental performance along with enabling compliance with appropriate legislation (Sorooshian *et al.,* 2018). Initially some viewed ISO 14001 as a badge, something to display rather than having a positive impact on the environmental performance of the organisations (Dogui *et al.,* 2014). EMSs are a voluntary standard, so their implementation is a choice remembering that their implementation and operation does incur costs, demands staff training and require buy-in from senior management. Organisations considering the use of an EMS need to be fully aware and have a comprehensive understanding of the benefits and barriers to their uptake and usage (Waxin *et al.,* 2019).

Many international studies have attempted to gauge organisational benefits and barriers of implementing ISO14001 (Rodriguez *et al.,* 2011; Waxin *et al.,* 2019; Carrillo-Labella *et al.,* 2020; Chen *et al.,* 2020a), especially in the AEC sector (e.g. Hong Kong (Shen and Tam, 2002), Nigeria (Owolana

and Booth, 2016), UK (Bailey *et al.,* 2020), Maldives (Rasheed *et al*., 2023). Most of these studies have utilised quantitative approaches (e.g. questionnaires) for their investigations. No previous studies have delved deeper and used a phenomenological methodology to investigate implementing EMS in the AEC sectors. Therefore, the aim of this study is to explore the '*lived-experience'* of those environmental professionals involved in the implementation and operation of ISO14001 in AEC organisations, as an attempt to understand underlying issues associated with their uptake and to gather insights into gaining and maintaining ISO14001 accreditation.

BACKGROUND

Ensuring economic prosperity of any organisation which factors in their environmental impact is a challenge for any industrial sector (Chen *et al.*, 2020b). Most organisations will only survive if they are profitable or, at least, their forecast shows them to be heading in a viable direction. The decision therefore to employ an EMS is often multifaceted, requiring careful consideration because it can impact the short- and/or long-term performance of an organisation. However, EMS can also be a mandated prerequisite for attracting business and enabling engagement with tenders for future business thereby improving prosperity.

Shen and Tam (2002) were amongst the first to explore the plethora of benefits and barriers associated with adopting ISO14001. Their study investigated the Hong Kong construction industry, revealing that environmental protection and reduced environmental risk were considered the most significant benefits of implementing an EMS, whilst increased management costs and lack of trained staff and expertise were considered the most important barriers. Owolana and Booth (2016) investigated the Nigerian construction industry, revealing reduced environmental related sickness and injury, and environmental protection were considered the most significant benefits and lack of government legal enforcement and lack of technological support were considered the most important barriers. More recently, Bailey *et al.* (2020) investigated the UK construction industry and

revealed reduction of environmental risks and contribution to environmental protection were considered the most significant benefits and lack of subcontractor co-operation and cost benefit of the system were considered the most important barriers.

Other benefits, cited in literature, include improving corporate image, reducing environmental risks, improving environmental standards, reducing environmental complaints, reducing environmental related sickness, increasing competitiveness, improving workforce morale, cost savings due to reduced risk of fines (Shen and Tam, 2002; Turk, 2009; Sakr *et al.,* 2010; Teriö and Kähkönen, 2011; Nguyen and Hens, 2015; Owolana and Booth, 2016; Johnstone, 2020). Other barriers cited include lack of appropriately trained staff, lack of client and subcontractor support, time required, lack of supplier cooperation, difficulty in coordinating environmental work over a multitude of tiers in the supply chain, lack of workforce support, increased documentation, lack of technical support, lack of training, lack of legal enforcement and the required change processes (Shen and Tam, 2002; Babakri *et al.,* 2003; Turk, 2009; Turk, 2012; Owolana and Booth, 2016; Schmidt and Osebald, 2017; Bailey *et al.,* 2020; Johnstone, 2020).

Opinions differ as to whether the benefits and barriers are location-linked and/or time-dependent, and the choices identified in the literature vary, so this needs further exploration. For instance, Horry *et al.* (2022a) suggests, over time, the benefits and barriers have changed slightly reflecting new expectations within business and wider society. Today, there is more focus on the improvements with stakeholders, tender requirements, community participation, industry standards, more efficient operations, increased employee awareness, energy efficiency savings; yet environmental improvement is still viewed as the main benefit of implementing and using an EMS (Horry *et al.,* 2022a). In terms of barriers, cost is still the main influencing factor but, the challenge of senior management commitment has been mitigated to a degree by the 2015 update of ISO14001 (Lewandowska and Matuszak-Flejszman, 2014).

RESEARCH DESIGN AND METHODOLOGY

Philosophy underpins the design of research studies. Traditional philosophical fields proposed by Aristotle, Socrates, Plato and Russell are: Ontology, which asks - what is? Epistemology, which asks - how we know? Logic, which asks - how to reason? and Ethics, which asks - how we should act? However, the later philosopher Husserl proposed phenomenology, which asks - how we experience? It is this latter stance that provides the underpinning position for this study.

As this work uses a phenomenological-based methodology (i.e. understanding experiences) it uses a lifeworld perspective to gain a deeper understanding of personal experiences (Willig, 2013). Using a qualitative research strategy encouraged the use of semi-structured interviews as the means of inquiry. This enabled the main questions to be asked in the same manner with the same words but where necessary the addition of follow-up questions if particularly interesting responses were received or any clarification of answers was required (Doody and Noonan, 2013). The main intent of the interviews was to gain a detailed knowledge and understanding of the personal experiences of professionals from within the AEC sectors who had direct involvement in the implementation and operation of ISO14001. The interviews were in two parts: Firstly, questions about a participant's background and demographics; and secondly, questions about a participant's 'lived-experience' of ISO14001 (Table 1).

Table 1: A list of the main questions posed to the participants.

#	**Interview questions**
1	Please describe your organisations approach to addressing their environmental impacts.
2	Please describe how your organisation approached the ISO14001 accreditation process.
3	Tell me about your experience throughout the process of attaining ISO14001.
4	Tell me about your experience of the potential organisational **benefits** yielded from implementing and gaining ISO14001 accreditation.
5	Tell me about your experience of the potential organisational **barriers** yielded from implementing and gaining ISO14001 accreditation.
6	Tell me about your experience of using ISO14001 to achieve the objectives of your organisation.

7	Finally, based on these experiences, would you recommend ISO14001 to other AEC organisations or would you encourage them to seek an alternative approach to meet their environmental/sustainability targets?

Sample Size, Selection and Recruitment

Due to the nature of the enquiry, participants needed to be experienced in respect of ISO14001 so purposive sampling (a non-probability sampling technique) (Etikan and Bala, 2017) was adopted, using explicit inclusion criteria, namely: participants must have a minimum of five years' experience in the sector, be employed by an AEC organisation holding ISO14001 and they must have personal involvement in the implementation and operation of ISO14001 before and/or after accreditation. This allowed a specific targeted group of participants to be invited for interview (Klar and Leeper, 2019). Anonymity was assured to encourage open and frank discussion.

Data Collection and Analysis

All interviewees requested online interviews. These were digitally video recorded (taking ~30 minutes) and the recordings transcribed using captions on the system. This was then reviewed to ensure that the captions were verbatim. To preserve the participants anonymity, no names were stored in the transcribed text.

Typical of phenomenological studies, no computer data analysis software was used (Capodanno *et al.,* 2020). The transcripts were reviewed using a stepwise process (Table 2), where the researchers repeatedly reading each of the transcripts to extract interrelated themes and meanings (Amos, 2016). This ensured the themes and subthemes highlighted were an accurate representation of the phenomenon under review (Smith, 1995: Smith and Osborne, 2003).

Impartiality was maintained by the researchers being in accord with the phenomenological principle of epoche (or bracketing), where the aim is to avoid any preconceptions or expectations in relation to the phenomenon of the study (Souza, 2014). One researcher had previously implemented and used ISO14001, albeit not in the AEC sector, they abstained from the analysis process so they would not influence or impact the outcomes and interpretations.

Table 2: Description of the stepwise process used to analyse the participant interview narratives (based on Smith (1995) and Smith and Osbourne (2003)).

Step	Description
1	Reading and re-reading of the interview transcripts to gain firstly a general sense of the whole interview responses.
2	The transcripts were then re-read noting any emerging themes.
3	Taking the noted themes, grouping and defining them, allowing for a focus on any interrelationships between the themes.
4	Where shared themes existed, these were then used to produce meaningful and accurate statements. These led to the production of the meaning and experience of the participants using their own words.
5	The subordinate themes and statements were then compared against the original transcripts to verify the findings.

Ethical approval was gained prior to the interviews and all participants received a project letter detailing that their consent and involvement was anonymous and entirely voluntary. This information was reconfirmed at the interviews were being recorded and how the data would be kept at the interview. After the interview the interviewees were given a two-weeks to allow them (if they desired) to withdraw their responses. This approach is compliant with the expectations of UK university research ethics regulations.

RESULTS

Using the themes and subthemes generated through analysis of the transcripts, along with selected verbatim quotes, the findings are presented beneath under five main section headings: (a) Participant demographics and backgrounds; (b) Opening doors; (c) It is more than it ever was; (d) A

standard for achieving objectives; and (e) A modern-day necessity. To ensure anonymity, no personal information about the participants is used in any of the descriptions and those direct comments included do not divulge any identifying factors.

(a) Participant Demographics and Backgrounds

Eight participants responded to the invitation to be interviewed about their *'lived-experiences'* of ISO14001. This number, which may seem small, is in accordance with what is expected of a phenomenological study (the number of participants being between 6-8, aligning with those noted in Laczko *et al.* (2022), Serjeant *et al.* (2021) and Fong *et al.* (2021) who used six, seven and eight participants, respectively.

Table 3: Participants profile data (n=8).

Participant	ISO14001 in place	Role	Years experience	Turnover (£ sterling)	Sectors	Highest Qualification	Professional body membership
1	Yes	Environmental Manager Large Scale Construction	22	Over 10 billion	AEC	BSc	IEMA
2	Yes	Group Sustainability Manager	20	Over 1 billion	AEC	MSc	IAQ, IES, Chartered Scientist
3	Yes	Regional Environmental Advisor	21	Over 1 billion	EC	MSc	IEMA
4	Yes	Group Head for Environmental Risk and Compliance	30+	Over 1 billion	EC	BSc	IEMA, Chartered Environmentalist, Chartered Manager.
5	Yes	Environmental Manager	14	Between 5 and 10 billion	AEC	MSc	IEMA
6	Yes	Senior Environmental Manager	25	Over 10 billion	EC	MSc	IEMA, Chartered Environmentalist, Chartered Member of IOSH.
7	Yes	Director	22	Over 100 million	AEC	MSc	No
8	yes	Divisional Quality Manager	6	Over 5 billion	E	MSc	CQI, IHT

Each of the participants who took part in the study confirmed they had personally been involved in the implementation and use of ISO14001. The timescales for participant experience ranged from 6 to over 30 years.

(b) "Opening Doors"

All the participants stated that their companies were engaged in the sustainability agenda, and many were keen to note that their companies were early adopters in setting sustainability-related objectives. Those early adopters had to deal with a lack of knowledge of ISO14001 and appears to have been driven by their directors. This is highlighted by statements such as participants recollecting being instructed "w*e want this ISO14001, come back and tell us when we have it*" (Participant-7). This emphasises a lack of involvement by senior leadership - common in early adopters. Often the Health and Safety staff tended to be handed the task (Participant-5), and it is treated as a risk-focused exercise. Several of those interviewed noted that they were doing much of the work themselves and that this had required them to pull together data and documents needed and organise it into an auditable set of information. This situation has changed as evidenced by the statement "*it isn't something in a book down here on the shelves* [reaching down behind their desk] *it is actually lived and breathed daily within the business*" (Participant-7).

Several participants mentioned that there is a "*groupwide approach to sustainability".* The majority of those interviewed worked for organisations who used combined management systems, bringing together health and safety, quality, and environmental management. It was noted that the "*key is making sure that that everyone is using the same information and that all the policies are aligned. The biggest issue we have found is consistency"* (Participant-2) This was particularly observed within companies procuring smaller businesses to be part of their group, where the smaller companies did not have an EMS in place.

In relation to the groupwide sustainability most of the participants highlighted that their organisation's sustainability strategy was about their company survival. This is evidenced by the statement *"really a business needs* [great emphasis on needs] *to win work on their sustainability framework. So, whilst we're happy doing 'the carbon' to a level, a simple level, we probably wouldn't have continued doing that if it wasn't for the fact our customers were asking for it"* (Participant-2). This shows that while an organisation may engage voluntarily on the easy, quick wins in relation to sustainability it is customer pressures that is driving them to do more in relation to sustainability. The pressure is external with requests from their customer base driving this increased engagement. This was highlighted by all participants noting that they were involved in bidding on UK government frameworks, which is where most government contracts are found in the UK. These frameworks specify mandatory criteria which are requirements for engagement and include requirements such as the organisation quoting for the tender must have ISO14001 certification. All the participants stated that a primary benefit of ISO14001 was the ability to engage with frameworks and tendering processes to bid for contracts. This is clearly demonstrated by the statement *"in any contract in business, if you're not meeting the current standards, you won't be entertained or considered for a framework or contract."* (Participant-4). It is satisfying to hear that all the companies are delivering environmental improvements, it is however disappointing that their rationale is not for the good of humanity or because it is the right thing to do but because it is seen as a necessity to win new business. This is confirmed by the statement *"whilst we'd like to say it's the right thing to do…really it's a business success requirement"* (Participant-2) and this was further confirmed by the participant, who stated the reason for doing their sustainability work was *"…in order to win contracts* [nodding]*"* (Participant-3). So, while these professionals all indicate that protecting the environment and being a sustainable organisation is the right thing to do, the reasons why many organisations are involved is to increase their opportunities to engage with tendering processes and ensuring the financial health of their companies.

(c) "It Is More Than It Ever Was"

All of those interviewed emphasised that ISO14001 was a starting point and not the end of their company's sustainability journey. This collective view that ISO14001 is a minimum standard may hold out some hope for environmental improvements. This is supported by the statement *"to say that there's any benefit to having the minimum, there isn't, because I think the world expects a lot more on top of that…14001 is just like a benchmark*" (Participant-2). This suggests the sector has moved away from examining whether ISO14001 has benefits or barriers, to it is the expected norm. It is also noted that the norm is not sufficient, and that stakeholders and customers are expecting much more *"a hell of a lot more than ISO14001 is"* (Participant-2). The idea that ISO14001 is a minimum is supported by the questions that the participants state are the increasing expectations of their customers such as *"what can you do to help us design a carbon zero building…which are far more advanced than 14001"* (Participant-2). Of course, ISO14001 can be whatever the system is designed to be. It is for the organisation involved to decide on the objectives they choose to include, such as the management of risk in relation to climate change.

Risk management is a significant issue within business and was flagged as a benefit of ISO14001 by most of the participants. They noted that the system has made their organisations consider their impacts in a more deliberate manner. This is noted by comments such as *"I think what it really helped to do…was help to get parts of the organisation that maybe didn't think they had an environmental impact to understand they actually did…purchasing would be a good example* [smiles] *that, you know, the conventional thing is we are just in an office…but it's the decisions you make and the suppliers you choose...will their control, be as good as ours"* (Participant-6). This issue was noted earlier where central teams sometimes did not comprehend their impacts. This could be extremely important moving forward in relation to hidden environmental impacts in areas such as the supply chain which will also need to be managed.

The management of the supply chain is a potential challenge, however site operations and the opportunities for cost savings were benefits highlighted by several of the participants. Participants are quoted as noting *"management of waste can actually be a massive cost, not saving necessarily, but actually generate profit"* (Participant-7). This demonstrates another means by which organisations can increase their profits through careful management of their resources, but this requires knowledge and facilitation within the organisation to enable this opportunity to be accrued.

The enforced involvement of the senior management team is seen as a big step forward from the situation mentioned earlier where the board just instructed someone to go away and get the standard. The current standard requires active observable involvement of those in positions of senior management. This increased focus on senior management commitment in the 2015 version has had a positive impact in the views of some of the participants as this comment suggests *"whilst directors might have said 'yes, we're committed to this strategy', getting them to prove their commitments and that they were delivering on it was then much firmer with-it being part of the 14001"* (Participant-4).

(d) "A Standard for Achieving Objectives"

One issue within the AEC sector noted by all the participants was the focus of ISO14001 on the organisations facilities rather than their operations. This is an issue for the AEC sector because their major impacts are on the sites where they have management control purely during the build phase, the sites then being handed over to others. The AEC organisations obviously have impacts on those sites, during construction but the scope for their ISO14001 system is their offices and may include transport but it is unlikely for individual construction sites to be in scope. Concerns were expressed by several of the participants that there is a gap in the system due to this. This is supported by the statement "*not really much you would want to put into 14001 that was construction site related apart from your policies and procedures…because if you put it in, you're bound to it"* (Participant-2).

This demonstrates concern over deliverables in the management system, raising an interesting question as to whether a management system should be set up to pass or should it challenge organisation to do more? It could be questioned as to whether this produces the best outcome for the environment, if those involved are only working towards objectives that they know are guaranteed to be delivered rather than being purposefully challenging. This raises is an interesting question in relation to audits, target and auditor involvement and independence (Dogui *et al.,* 2014).

It is important to recognise that ISO14001 is just a system, it does not specify objectives and so is only as ambitious as the organisations, or senior management teams setting the objectives. In this work those interviewed were from organisations who have held the standard for many years, and it was interesting to hear comments such as "*we felt as a team, that 14001 didn't* [hesitating, before continuing with reticence] *drive us in terms of environmental performance…we felt that having an environmental management system was very good at risk identification and management of risk, but it didn't necessarily sit with…moving the business forward…we wanted something that was a bit more, a bit more dynamic, a bit more fluid, … a bit more engaging. The structure of 14001 means that it doesn't necessarily resonate with people, particularly non-operational, people who aren't used to following processes, which is why we then sort of pulled back a bit and developed an overarching strategy that was a bit more, I don't know, user friendly, if you like"* (Participant-3), while Participant-8 noted *"it's all about waste…mixed waste in that bin".* This suggests that while ISO14001 is great at managing the environmental impacts it could help guide companies when they have gone past that initial phase of their EMS, and they are looking for something more aspirational. As a standard ISO14001 can deliver on this, however the organisations may not want to commit themselves to objectives which lack clarity of definition or do not have measurable outcomes for fear of the auditors' reactions.

In relation to how organisation use the standard some of the participants declared they were purely using the EMS for environmental management, as originally designed; therefore, the focus was on reducing energy use or the amount of waste produced. This is supported by the statement "*14001 is largely environmental...we split environmental* [looking skyward] *… It's all about planning consents, discharge and planning consents, tree preservation orders, wildlife stuff…nothing to do with sustainability and carbon reduction* [smiling]" (Participant-2). Most participants, however, were using the system to manage their sustainability work too, which was highlighted by the participant who said *"you only put in what you are happy to achieve…we don't have a separate 14001 management system. You make the 14001 fit the system you've got…14001 isn't being used as a marketing tool,* [shakes head] *but the net zero strategy in approach is…maybe there needs to be another 14001, which looks at sustainability rather than environmental stuff"* (Participant-2). This highlights that there may be some lack of vision in relation to the opportunities for the use of ISO14001, it is a system and, as such, could easily be used to support the zero-carbon agenda, sustainability, or risk management. However, this would require organisations to make commitments in relation to all their objectives and expand the scope.

(e) "A Modern-day Necessity"

The participants were clear about whether they would recommend ISO14001 with comments such as *"I would certainly recommend for any organisation that wants to be independently challenged and scrutinised to a common standard to adopt ISO14001"* (Participants-4 and -5). Others noted that ISO14001 has benefits that would be useful, with Participant-3 stating "*14001 really does well when it comes to risk management...I think* [pausing] *as a performance enhancing system."* There were, however, also expressions of concern in relation to the size of the organisations considering using the system and thoughts were expressed that "*ISO14001 might not be the best approach for an SME organisation"* (Participants-1 and -4). In such scenarios it was thought that larger companies could

direct smaller companies within their supply chain towards alternative schemes (e.g., BS8555) so they can take their first steps towards ISO14001.

All the participants agreed that ISO14001 was not without challenges, with one participant saying, *"I've heard a lot of things for and against 14001…I would still see 14001 as the kind of de facto environmental management system"* (Participant-1). A small number noted you could do the same work but, in another way, but as one noted *"like a lot of badges. Is that the right way to describe it? It is a prerequisite to getting into their supply chain, let alone getting to the framework, the tenders, and the like. So, if you don't have it. You're not getting to them"* (Participant-7).

All the participants declared they would recommend ISO14001 but with the proviso that it *"has to work for the business".* The scheme needs to identify an obvious value, which could be if they intended to engage in a tender process. Others noted it should not just be a badge, which is evidenced by the statement *"it has to have some business benefit to do it, whether that is just because your customers require it...it's always going to be an economic decision because the amount of resource you have to put into it* [grinning]*"* (Participant-2).

An interesting point made was that not all organisations who issue tenders requiring ISO14001 have it themselves. This is evidenced by the statement *"what I find fascinating is that many client organisations require 14001 as part of any contractual work that they undertake. But very few of those organisations have ISO14001* [shaking their head]*"* (Participant-4). This questions how these organisations are managing their own impacts and what happens after the handover? Are they run in a sustainable manner or are the owners relying on the AEC sector delivering an environmentally sound building?

DISCUSSION

While most participants within this study noted their organisations are using ISO14001 to manage both environment and sustainability objectives within their operations, some are still separating-out issues such as waste management and energy-use into an EMS while another department has responsibility for sustainability matters. It is suggested that this results in a doubling-up on costs, as environment and sustainability are inextricably linked and rationalising these areas could increase benefits (Boiral and Henri, 2012; Oyelakin and Johl, 2022). It is interesting to note the concern expressed in relation to the not achieving objectives and this brings into question whether all objectives should be to be ticked off the to do list in one or two years or being aspirational; something to aim for (Sorooshian and Yee, 2018; Mosgaard *et al.,* 2022).

It has become clear through this study that ISO14001 has become a requirement on a large proportion of tenders particularly those relating to government departments (Horry *et al.,* 2022b). To engage with these tenders there is a requirement for organisations to have an EMS in place. This new requirement demonstrates a change in stakeholder perspective and that the emphasis is on protecting the environment (Seroka-Stolka and Fijorek, 2022); however, it would be questioned as to whether those producing the tenders should also consider the environmental impacts of their own operations rather than relinquishing responsibility to the subcontractors.

The idea proposed by most of the participants was that ISO14001 is purely a starting point (Johnstone, 2022). This would suggest that the companies whose employees took part in this research are aiming to be more sustainable than purely box-ticking on a tender form. It must be noted though that all those taking part worked within organisations were early adopters of the ISO14001 system and had been working to these standards for many years. It does suggest though that something more is needed than just ISO14001 to enable companies to navigate the issues of delivering on their environmental and sustainability objectives over the years (Horry *et al.,* 2022a). Currently the system does not differentiate between those who have just gained the certificate and

those who are really making a difference in respect of their environmental impacts (Horry *et al.,* 2022a).

The findings revealed that the benefits cited for using ISO14001 are moving away from purely legal compliance (Shen and Tam, 2002). An EMS is now seen as a necessity in relation to the tendering processes that are available through the various procurement frameworks. ISO14001 is seen as a starting point, from which companies move to be more engaged in the sustainability agenda (Maletic *et al.,* 2015). There is a difference of opinion witnessed in these interviews in relation to the suitability of ISO14001 to be used to manage both sustainability and environmental management, with some seeing the system as still purely an environmental management tool (Oyelakin and Johl, 2022). This is interesting, as the system, was designed to be flexible and as such can be used for whatever the requirements of the organisation are. The concerns expressed are very much centred around the ability or willingness of the organisations to state their sustainability objectives in a system that will be audited, particularly in relation to site specific issues.

The study suggests that ISO14001 has become an expected norm within business for engagement on frameworks for tendering for UK government projects. All the participants noted that it was a mandatory tick on the tender application paperwork, rather than being part of any more in-depth scrutiny (Morrow and Rondinelli, 2002). The professionals who took part in these interviews all vouch for the value in having a system to take their organisations further than just the basic criteria, or the idea of we *"have the badge"* (Johnstone, 2022). The challenge of bringing sustainability into the equation is another matter, with some suggesting that there may be a reluctance to state sustainability factors as objectives as this may require companies to deliver on something vague which may prove challenging (Mosgaard *et al.*, 2022). From the accounts analysed in this study, ISO14001 is still a firm favourite for delivery of environmental objectives, but it is not yet completely accepted as a delivery mechanism for sustainability.

CONCLUSIONS AND RECOMMENDATIONS

This research set out to look at the lived experience of the industry experts involved in the implementation and operation of ISO14001 within the AEC sectors. Cost, time, and staff knowledge are cited in the literature as being the main barriers to the implementation of ISO 14001. This study reviewed the barriers and benefits of ISO 14001 using a phenomenological approach, and the themes highlighted from the analysis of interview statements suggest ISO14001 is a starting point on an environmental-focused journey, and a necessary requirement for any organisation who are wanting to engage in the tendering process. To engage with many tenders (particularly those from UK government departments), organisations must now have ISO14001 in place. ISO14001 is a prerequisite for engaging with certain organisations. How the system is implemented, and the effectiveness of the system is not judged, it is a mandatory tick box on the tender form.

All the participants in this research worked for companies that had ISO 14001, so their organisations had already established the benefit to establishing the system. The interesting finding was that some of those employee organisations were found to be using the system to deliver on sustainability priorities, as well as environmental management, while others are still separating the two terms from each other.

The voicing by the participants of ISO14001 as a starting point is comforting implying that organisations are taking their environmental responsibilities seriously and engaging proactively with the environmental/sustainability work even if this purely because of it being a stakeholder requirement. The separating of environmental management and the more ethereal sustainability agenda is an issue as there is the risk that organisations will be compliant but not aim for sustainability.

Further research would be useful to establish the benefits seen by those who are merging their environmental and sustainability objectives and what challenges are seen by those who choose not to do this. ISO14001 is clearly seen as a necessity by the participant involved in this research but how this is implemented is still subject to variation. More work is needed to ascertain whether the barriers and benefits are purely organisation or sector specific.

It is recommended that research is conducted into how environment and sustainability are managed within organisations to ascertain the effectiveness of splitting out environment and sustainability. As ISO14001 was seen as a starting point it would be interesting to see how far beyond the requirements of ISO14001 companies are progressing.

Finally, work is still needed to demonstrate to organisations that ISO14001 can deliver in respect of sustainability and that it is not just a system for managing the environmental impacts. Further research is suggested to investigate whether sustainability can be included within the management system (ISO14001) for the lifecycle of the buildings with numerous parties involved. It also needs to be established how an EMS can be audited so organisations do not fear their inability to deliver on their objectives immediately and how support could be provided to move them from a purely legal compliance environmental management situation to a more sustainability deliverable agenda.

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