



**The misplacement of ISO 18404:2015 in organizational improvement: A point-counterpoint article**

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6 **The *misplacement* of ISO 18404:2015 in organisational improvement: A point-counterpoint article**

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27 **Abstract**

28 **Purpose** – This paper gives the background to the ISO 18404:2015 standard and  
29 explains its rationale. It aims to rebut the Oudhriri et al. (2022) paper.  
30 Furthermore, this paper adds further evidence of the misplacement and unfitness  
31 for use of the standard, as evidenced in the previous work by Antony et al. (2021,  
32 2022a, and 2022b).

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35 **Design/methodology/approach** – A point-counterpoint methods approach with  
36 a literature review of studies available on ISO 18404:2015, to respond to the  
37 Oudhriri et al. (2022) study.

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40 **Practical Implications and Findings** – The findings indicate that Oudhriri et al.'s  
41 (2022) work can be answered and counter argued.

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43 **Research limitations** – Other than Antony *et al's* three studies (2021a, 2021b,  
44 2022) and Oudhriri et al's (2022) study empirical studies looking into the impact  
45 of the ISO 18404 standard in the literature were limited. As the literature has  
46 shown, many companies are not utilising the standard given its current format;  
47 hence a lack of information relating to the practical implementation is sparse.

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50 **Originality/value** – This study consolidates and strengthens the findings from the  
51 three studies by Antony et al. (2021a, 2021b and 2022) and acts as a rebuttal to  
52 the Oudhriri et al. (2022) study.

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54 **Keywords:** ISO 18404, Six Sigma, Lean, Lean Six Sigma, Quality, Standards,  
55 Continuous Improvement

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57 **Papertype:** Research article  
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## Introduction

The authors welcome the recent paper by Oudrhiri *et al.* (2022) as adding to the extremely limited number of articles published on the ISO 18404:2015 standard.

Oudrhiri *et al.* (2022) point out that Antony's publication " *is unfortunate since a review paper on the transformational aspects of the global ISO 18404 standard, in contrast to earlier certification approaches, would be highly beneficial in explaining the transition from a "body of knowledge" to a "competency-based" approach*". Yet the Royal Statistical Society (RSS) who act as a sector overseer or competent authority for notified bodies who are certifying organisations to the standard contradicts this move from a body of knowledge in describing the " *body of knowledge* " required for the certification of the standard (Royal Statistical Society, 2015).

The current paper aims to rebut incorrect information and aspersions presented in the work of Oudrhiri *et al.* (2022) concerning the study by Antony *et al.* (2021a). We utilise a point-counterpoint methodology (Bromiley and Rau, 2016; Greenstein and Lamster, 2001). Interestingly the study by Oudrhiri *et al.* (2022) claims to correct misconceptions presented by Antony *et al.* (2021a). Published researchers often disagree in opinions and findings, but Oudrhiri *et al.*'s (2022) study has critiqued almost the entirety of the Antony *et al.* (2021a) study. This critique was based on narratives by participants, where some of the participants are authors of the paper. Thus, the study by Oudrhiri *et al.* (2022) suffers from forms of selection bias (Pannucci and Wilkins, 2010). Further participants and authors who are interpreting the narratives are the same persons, thus the interpretative validity of the study is questionable (Altheide and Johnson, 1994).

A wide representation from the Lean Six Sigma community is represented in all of Antony *et al.*'s (2021a, 2021b and 2022) published studies on ISO 18404 although only one study was published at the time of the publication of the Oudrhiri study. Conversely, the Oudrhiri *et al.* (2022) authors self-declare that they include members of the BSI/MS006 (MS6) Technical Committee that have been actively involved in the drafting, review and development of ISO 18404:2015, members of the Royal Statistical Society's Oversight Committee for ISO 18404, and employees of international organisations involved in ISO 18404:2015 certification and consultancy activities. Indeed in the limitations section of the abstract, Oudrhiri *et al.* (2022) pointed out their own limitation " *A very real constraint when conducting research into ISO 18404:2015 is to obtain a balanced view of the standard which is balanced with respect from those who have a vested interest in its continuation and evolution, or not.*" Conversely, in all 3 of the studies by Antony *et al.* (the second and third one published in late 2022 after the Oudrhiri study ) on ISO 18404, there is a cross-section of academics, lean practitioners and writers who have no vested financial interest in the rise and fall of the ISO 18404:2015 standard. Further the participants in the Antony study were not the authors and hence this adds more interpretative validity for the research. This papers methodological steps are the following:

- (1) A review and a rebuttal of the Oudrhiri *et al.* (2022) study and defence of Antony *et al.*'s (2021a) study via use of point-counterpoint.
- (2) Recommendations & Conclusions

## 2. Methodology utilised

Point-counterpoint methodology was utilised in this paper. Ketokivi (2016) argue for point counterpoint by stating “ *Agreement is over-rated; let us instead invite different, even opposing points of view, so that we can learn something new*”. In this paper each opinion (or as many as possible), point or statement of Oudhriri et al (2022) is examined and responded to with a counterpoint or counter statement. The authors of this paper include their opinions in the point/counterpoint format as well as citations to recently published literature or any other relevant sources to back up their counterpoint(Kesselman and Barbara Watstein, 2005). The point-counterpoint aided obtaining of a balanced view via a thorough treatment of ISO 18404 through comparison the Antony et al (2021a) and Oudhriri et al (2022) papers were utilised to obtain two different viewpoints (Ketokivi, 2016). As with many point-counterpoint articles two very different ways of viewing an issue can emerge (Krahnke *et al.*, 2003) and the authors of this paper seek to represent the current position of ISO 18404 via the comparison of the 2 aforementioned papers which best represent these differing points of view. As Antony et al (2021a) and Oudhriri et al (2022) have both already published some differing and also some similar opinions and positions on ISO 18404 -the authors of this paper have summarized their viewpoints, read each other's summary, and have responded utilising a point-counterpoint to provide a flavour of that dialogue (Krahnke *et al.*, 2003). Point-counterpoint has been utilised in many studies in many different fields and to discuss many different topics and in some cases such in as in this paper also offer a rebuttal to previous research papers (Greenstein and Lamster, 2001; Kesselman and Barbara Watstein, 2005; Krahnke *et al.*, 2003). Schneidewind and Fenton (1996) utilised point-counterpoint in a topic similar to this paper in investigating whether there was requirement for software quality standards and if their use improved software quality. By offering two opinions - that of the authors of Oudhriri et al (2022) and those of the authors of Antony et al (2021a) and the wide circle of research participants involved in both studies, the authors of this study hope to add to the dialogue and debate around the use of a standard for LSS.

## 3. Review of Oudhriri et al. (2022).

### 3.1 Errors in citations

Oudhriri et al. (2022) called out a number of errors in Antony et al. (2021a) and cited confusion in Antony’s paper between ISO 9000 and ISO 9001. However, they did not explain or elaborate on this purported confusion any further.

The Oudhriri et al (2022) paper also called the academic integrity of Antony et al.'s (2021a) study into question, citing referencing errors (*plural*) but yet only mentioning one supposed error (*singular*), e.g., "*Bendell, 2016*". Oudhriri et al. (2022) stated that Antony “*miscited Bendel’s comments as “Bendell, 2016” and stated, “Antony's used comments that were from a book about Anti-Fragility that Tony Bendell published in 2014, which is before the publication of ISO 18404 in 2015 (Bendell, 2014)”*”. However, the Antony et al. (2021a) study cited only one reference of Bendell from 2016 based

on his blog (Bendell, 2016). The following (table 1 ) presents the cited section attributed to Bendell (2016) from his 2016 blog.

**Table 1:** A comparison of Antony et al.'s (2021a) papers citation of Bendell's statements (top) versus his own recorded statements (Bendell 2016) (bottom)

<p><b>Antony et al. (2021) extract from their paper.</b></p> <p><i>“Professor Tony Bendell, who developed the standard in conjunction with BSI and RSS, stated in 2016 that the standard was required as <u>the quality of Lean implementation and training is in many cases questionable, sometimes so bad that it does not just waste money in implementation but costs more, compounded by the absence of internationally recognised reference standards (Bendell, 2016). Bendell (2016) also added that a LSS practitioner needs considerable additional skills and competencies over and beyond the knowledge of the tools, such as managing stakeholders, project management and improvement, finding appropriate data to measure current performance, leading and managing a team, motivating, communicating, and managing their own development. All of these competencies are reflected in the standard”.</u></i></p>	<p><b>Extract from Tony Bendell's blog</b></p> <p><i>“As anyone practicing in the real world knows, <u>the quality of much Lean implementation and training is in many cases questionable, sometimes so bad that it does not just waste money in implementing, but it actually makes things worse. ....Similarly, anyone who understands Lean knows that a Lean practitioner needs lots of additional skills and competences over and beyond knowledge of Lean tools. They must be able to manage stakeholders, often project manage improvement, find appropriate data to measure current performance, lead and manage a team, motivate, communicate, and manage their own development.</u></i></p>
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Oudhriri et al. (2022) stated that “throughout their paper, Antony et al. (2021) show a misunderstanding of the ISO standard development process”. Oudhriri et al. (2022) also highlight that “the process used for the development of ISO 18404:2015 was identical to that used for other standards”. Antony et al. (2021a) do not refute that the process was adhered to. Instead, they point to the fact that they were not aware of 'any internationally recognised or experts at a national level that was involved". Professor Bendell is the only internationally recognised Lean expert publicly seen to be involved in the standard originally, and this viewpoint by Antony et al. (2021a) can be upheld. To quote Antony et al. (2021a), "The standard was shared during a presentation by Prof. Tony Bendell who developed the standard in association with the British Standards Institute (BSI) and Royal Statistical Society (RSS)." Antony et al. (2021a) never claimed that Bendell was the author (but Oudhriri et al. (2022) misattributed this statement to them) but rather they stated he was part of the ISO process that developed it. Oudhriri et al. (2022) highlighted that Bendell was not the

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3 author nor even on the committee that developed the standard, yet in the same paper  
4 stated that he was chairman of the committee that had oversight in BSI for the  
5 standard development. The oversight committee referred to as M006 by Oudhriri et  
6 al. (2022) or MS6 on Bendell's profile on Services Ltd.com. is also referenced on  
7 Bendell's Services Ltd profile (Bendell, 2018) where the following is stated;

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9 *"He chairs the MS6 Technical Committee of BSI, which has responsibility for process*  
10 *efficiency, effectiveness and improvement. This did the development work for the*  
11 *creation of the international certifiable ISO Lean Management and Six Sigma*  
12 *standard ISO18404, published in December 2015. He is now leading the Sector*  
13 *Scheme for bringing forward this standard under Harmonised European*  
14 *Accreditation through the United Kingdom Accreditation Service (UKAS). He also*  
15 *chairs the Royal Statistical Society Quality Improvement Section"* .  
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19 In the biography of Bendell as a Keynote speaker for ELEC 2016, the bio stated,  
20 "Professor Tony Bendell will be discussing the new ISO standard on Lean and Six Sigma.  
21 Tony has been a leading figure in the development of the new standard (18404) that  
22 has implications for many Lean organisations" (European Lean Educators conference,  
23 2016). Bendell's own personal Twitter account profile states "heavily involved in the  
24 development of ISO18404" (Bendell, 2022).  
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### 28 3.2 ASQ Bias

29 Oudhriri et al. (2022) stated that "TM Kubiak who was interviewed by Antony et al.  
30 (2021), whose reported complaint appears to be not that experts such as he were not  
31 involved, but that the other international experts disagreed with his negative views on  
32 the standard" .They further state that Kubiak's views are "somewhat ASQ centric" as  
33 is "arguably is much of Antony et al. (2021), .....an advertisement for the American  
34 Society for Quality's Lean Six Sigma certification". Kubiak did not complain that other  
35 experts disagreed with him he simply stated that "I reviewed an early version of the  
36 ISO 18404 draft for the ISO International subcommittee 7 on Six Sigma and the USA  
37 voted no to this draft". This is a simple factual statement.  
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40 Antony et al. (2021a) approached Kubiak as he is one of the foremost recognised  
41 experts in writing certification material and body of knowledge as co-author of the  
42 ASQ CSSBB and author of the ASQ MBB handbook (Kubiak, 2012; Kubiak and Benbow,  
43 2016). He also was on the original US ISO certification committee for ISO 2015 in 2015  
44 and has stated that his feedback at the time on improving the standard was not taken  
45 on board.  
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49 Oudhriri et al. (2022) comment that "arguably" the Antony paper is "an advertisement  
50 for the ASQ" is just that -"arguable". Out of a panel of 14, 2 members had had an  
51 association with the ASQ, and both ASQ associations were past associations.  
52 On the one hand, they dismiss the Antony et al (2021a) articles proposition and  
53 contribution as "ASQ centric" but later cite a past president of the ASQ's opinions (an  
54 interviewee from Antony's study) as evidence of his support for the standard. The  
55 Oudhriri et al (2022) argument is inconsistent, and the authors need to decide  
56 whether Antony's study is or is not "ASQ-centric" and avoid contradictions. "Arguably"  
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3 can be interpreted in any fashion. As mentioned previously, a critique of Antony et  
4 al.'s (2021a) work was that it *"is an advertisement for the ASQs certifications"*. The  
5 view put forward by the interviewees of Antony et al. (2021a) is that they trusted and  
6 believed in the ASQ certification process and are were confident in its use. Antony et  
7 al. (2021a), while reporting on the popularity of the ASQ standards, simply reported  
8 from cited sources that ASQ was an internationally recognised certification body held  
9 in high esteem.  
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14 *Antony et al.'s (2021) purported conflict with ISO 18404's democratic purpose.*  
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16 Oudhriri et al. (2022) further stated that they were *"confident"* that Antony et al.  
17 (2021a) *"is in conflict with ISO 18404's purpose to democratise Six Sigma and Lean"*.  
18 Firstly normally, when researchers mention confidence, there is usually empirical  
19 evidence involved. Secondly, Antony et al. (2021a) conducted a qualitative research  
20 study and reported on the findings – yet they conflict with a democratic purpose?  
21 Antony et al.'s (2021b and 2022) 2<sup>nd</sup> and 3<sup>rd</sup> studies on ISO 18404 while published  
22 after the Oudhriri et al (2022) study and publicly available, is an even wider qualitative  
23 study than the first paper (Antony et al, 2021a) and utilised a quantitative study also  
24 to research the standard. As in the Antony et al's. (2021a) study, this second and third  
25 study reports both positive and negative aspects of the standard.  
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### 30 31 *3.3 Understanding of the ISO standard process.* 32

33 Oudhriri et al. (2022) discussed the *"apparent misunderstanding (by Antony et al.*  
34 *(2021a) of the ISO standard development process is the lack of understanding that an*  
35 *international standard needs to reflect the consensus of the global community"*. *This*  
36 *means that many good ideas and suggestions may not be included, especially in the*  
37 *initial version of the standard, if currently, the international community cannot agree*  
38 *on them"*. So technically, Oudhriri et al. (2022) state that the ISO standard  
39 development process does not need consensus from experts but that they *"can be*  
40 *included later"*. This statement also contradicts the so-called rigour of the ISO  
41 development process that created the standard as described by the authors and calls  
42 into question the robustness of that process in releasing such a standard.  
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48 Oudhri et al (2022) stated excuse that *"regular review and update of the standard,*  
49 *typically on a five-year cycle, still allows for further development and updating of the*  
50 *standard"* does not reflect well on the internal consensus and robustness of the initial  
51 development process. If this were a manufacturing process, one would question the  
52 customer focus in the shipping and release of the final "defective " product.  
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56 Oudhriri et al. (2022) agree that *"There are some good ideas from Antony et al.'s*  
57 *(2021) interviewees that are already proposed for inclusion when the standard is*  
58 *revised. For example, Yellow Belts were always intended for inclusion when agreement*  
59 *on requirements could be reached"*. Before the 5 year ISO systematic review cycle, it  
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cannot be known what the outcome of any process will be. For example; a decision could be made to withdraw a standard (ISO, 2019). It is difficult to say that had the standard been upheld without the vigorous objections of the US ISO TC in the 2021 review, that these changes mentioned above may have been incorporated? Certainly, neither the Oudhriri nor Antony study can make that claim. Indeed the Antony et al. (2021a) study was cited at the ISO final systematic review meeting as evidence of why the standard should not be upheld.

### 3.4 The omission of Lean Six Sigma from the standard

Next, Oudhriri et al. (2022) decried Antony et al.'s (2021a) reporting of views on the omission of Lean Six Sigma from the initial version of ISO 18404:2015 at length and cited that *"the initial difficulty was international agreement on a definition"*. Antony et al. (2021a) were simply reporting the viewpoints as found during the research; if this was reported *"at length"* (Oudhriri et al.'s term), they were simply doing what researchers do by reporting their findings.

Oudhriri et al. (2022) highlighted that Antony et al. (2021a) had the *"correct position expressed by an interviewee .... but is then ignored by the authors of that paper. As correctly stated by Dr Gregory H. Watson, past President of ASQ, within their article, the various complaints about not covering Lean Six Sigma are spurious anyway as Lean Six Sigma is only a remarketing"*. It should be pointed out that Oudhriri et al. (2022) are accusing the authors of being *"ASQ centric"* on the one hand (although Antony had only 2 interviewees associated with the ASQ, and these were past associations), but Oudhriri et al. (2022) are accepting the opinion of a *"past president of the ASQ"* on another hand. Kubiak's opinions as a member of ASQ were dismissed, but then Watson's opinions as a member of ASQ were accepted by Oudhriri et al. (2022). We quote Antony et al.'s (2021a) interview below in Table 2. Unfortunately, Oudhriri et al. (2022) have not quoted Watson's comments from his interview correctly. Watson did refer to LSS as a *"repacking"* when discussing its history, but as outlined in table 2 (bold font), he highlighted that ISO18404 *"structures the body of knowledge as if "lean" is distinguishable from "Six Sigma" and from "Lean six sigma" (implying it is not).*

Table 2: Dr Watson's interview from the Antony et al. (2021a) study

<p><b><i>Dr Gregory H. Watson, Consultant Business Excellence Solutions Ltd, Finland and Past President of the ASQ</i></b></p>
<p><b><i>"The fundamental problem with ISO 18404 is that it does not reflect reality. It structures the Body of Knowledge as if "Lean" is distinguishable from "Six Sigma" and from "Lean Six Sigma." (2002).....</i></b></p> <p><b><i>So, this contribution was primarily a "re-branding" of Motorola's program under a new label. Perpetuation of the myth of a lack of integration between these three methods does</i></b></p>



*a disservice to the profession at best and at worst leads potential practitioners of improvement methodologies into the quagmire of "dueling improvement methods" as they seek to solve real-world problems.*

The authors of Oudhriri et al. (2022) then go on to say, " *there is an intent to include it (Lean Six Sigma) when ISO 18404:2015 is revised*". Future intent is not evidence or a conclusion that there was inaccurate reporting and findings of Antony et al. (2021a) in terms of gaps in the standard.

### 3.5 ISO 18404 & SME's

Oudhriri et al. (2022) highlight Antony et al.'s (2021a) comments in relation to small to medium enterprises (SMEs) as "noteworthy". They highlight that "*SME issues with standards are a well-known topic in their own right and are not specific to ISO 18404:2015, for which the effect is likely to be much less than for say ISO 9001. For instance, Google identifies 182 million sources for "SME problems with ISO 9001."*" Irrespective of SME issues with standards, Antony et al. (2021a) reported their findings on the SME issues with the ISO 18404 standard in their original qualitative study. In fact, they published a third study (Antony et al, 2022) specifically related to ISO 18404 and SMEs in late 2022 to investigate . Google sources for problems with ISO 9001 is superfluous to their argument as it is not specific to ISO 18404. Initially, Oudhriri et al. (2022) dismissed Antony et al. (2021a) for the use of comparisons with the ISO 9000 series in their article.

Oudhriri al (2022) cited an example that the "*original certified ISO 18404 company was small, so small size is not prohibitive*". This sample size of "one", as evidenced by Oudhriri et al. (2022) is not a representative or generalizable sample. Antony et al. (2021 a ), cited repeated google search's yielding only limited publicly certified claims of having ISO 18404 certification (less than 5 companies found).

Oudhriri et al (2022) further critiqued Antony et al's (2021a) statement that it is difficult to reconcile ISO 18404 with a tailored approach. They stated, "*Tailoring, e.g. to the public sector, is not the main purpose of the standard itself and is being dealt with elsewhere but see Whitehouse and Bendell (2021)*". From Whitehouse and Bendell (2021), "*The paper proposes that the ISO 18404: 2015 Lean & Six Sigma international standard.....provides an ideal framework for implementing such approach for the UK and other public services*". Their work did not "deal" with any gaps in the applicability of the ISO18404 to public sector rather they reiterated its value.

### 3.6 Antony et al. (2021) Research methodology

Oudhriri et al (2022) also took to critiquing Antony et al.'s (2021a) research methodology and concerns related to "*their sample selection and bias. How members of the "sample" were actually chosen is unstated and given the known sceptics of ISO 18404:2015, a number appear to have been chosen for that reason.*" . Antony et al

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3 (2021a) approached a mixture of academics and professionals  
4 Antony et al (2021a) approached 20 respondents. Oudhriri stated, "*It is unfortunate*  
5 *that it is reported that "some respondents declined" the interview as they did not know*  
6 *enough, as the researchers apparently did not adequately brief them, but those that*  
7 *did respond show extreme ignorance of the actual standard in their misconceptions*".  
8 Some individuals declined to participate in the Antony et al (2021a) study not because  
9 they were not adequately briefed about the research but because they felt they did  
10 not know enough about the standard. Voluntary participation refers to a human  
11 research subject's exercise of free will in deciding whether to participate in a research  
12 activity (Israel and Hay, 2006; Lavrakas, 2008). This is research ethics and hence the  
13 researchers followed it in the study and further briefing would be infringing the rights  
14 of participants. To state that the Antony et al. (2021a) respondents are biased is  
15 notwithstanding the fact that the Antony et al. (2021a) respondents have no vested  
16 financial interest in the standard, and the statement contravenes good qualitative  
17 research and reporting of facts. Oudhriri et al. (2022) highlighted that many of Antony  
18 et al.'s (2021) participants were biased when different opinions were expressed on  
19 the standard.

20 Oudhriri et al. (2022) further state that Antony et al's (2021a) authors "*acknowledge,*  
21 *correctly, their researcher bias, but show little proficiency as claimed in conducting*  
22 *interviews.*" This study's authors would like to quote the statement verbatim from  
23 Antony et al (2021a) "*Unstructured interviews can be prone to researcher bias if*  
24 *interviewers are inexperienced, however, which can result in inappropriate questions*  
25 *being asked (Bohnet, 2016). To overcome the above issue, the authors carried out*  
26 *these interviews, as they all have extensive experience in conducting such interviews.*  
27 *The interviews were unstructured with the advantage that the respondents could*  
28 *expand, illustrate and digress (Kvale, 1983)."*

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39 In response to an accusation that "*the sample selected is very biased*", Antony et al.  
40 (2021a) retort that they selected as wide a membership of the academic and Lean  
41 practitioner community as possible. It should be highlighted again that none of the  
42 Antony et al. (2021a) authors or interviewees were involved in the propagation of the  
43 standard or are consultants with a financial interest in promoting the standard nor  
44 members of the notified body for the standard. Claiming bias from independent  
45 academics and Lean practitioners on their views and industry professionals interested  
46 in the right strategy for their organisations is simply a foil.

### 50 3.6.1 The critique of Christoph Roser

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52 Oudhriri et al. (2022) critique the inclusion of Christoph Roser as a pre-published critic  
53 of ISO 18404:2015 and cite him as "*erroneous*" in his previously published views  
54 stating, "*he admitted this himself*". The authors of this paper have highlighted Roser's  
55 comments "*ad verbatim*" in Table 3. We accept that he was a vocal critic of the  
56 standard, but the term "*erroneous*" is subjective. Roser was upfront and honest in his  
57 viewpoints.  
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Table 3

I discussed my opinions on ISO 18404 in my blog entitled "Lean Standard" ISO 18404 – A Questionable Idea..." in 2016, and my opinions **expressed below are unchanged five years on** (Roser, 2016).

In the literature review for the Antony et al. (2021a) study, Roser was one of the few public commentators who knew something about the standard, having read it and attended the perceived "Launch of ISO 18404" at ELEC 2016. Thus it was quite relevant to include him, especially in the absence of any other published work. Notably, the Antony et al. (2021a) study was titled "*ISO 18404:2015: Pros and cons*" and the aim was to research both sides of viewpoints related to the standard. Roser's inclusion is no more irrelevant than Oudhriri et al's (2022) inclusion of Prof Tony Bendell as one of their study's prime supporters, propagators and originators of the standard.

### 3.6.2 ASQ-centric view -part 2

Oudhriri et al. (2022) stated again (the second time in that article) that the Antony's et al.(2021a) study's interviewees "*represent the ASQ Six Sigma community, both being known to have negative views on ISO 18404:2015*". Irrespective of their purported "*negative*" views on ISO 18404, the ASQ are the world leaders in Lean and Six Sigma certifications and are internationally respected; thus, they were relevant to benchmark and review the standard. The authors of this study would reiterate that out of the 14 interviewees in the Antony et al. (2021a) study, only 2 interviewees had a past association with the ASQ.

The authors of Oudhriri et al. (2022) are more invested in ISO 18404, given their roles and relationships with the standard. For example, one participant involved in Oudhriri et al. (2022) was chairperson of the technical committee which developed the standard, is heavily involved in consulting and training of the standard and also chairs the Royal Statistical Society Quality Improvement section. Others are associated with the notified body, which helps certify organisations to the standard for a fee.

Whether the ASQ were involved and "*were specifically voted down by the international community when ISO18404 was approved*" is irrelevant as it is pertinent for the Antony et al.(2021a) article to understand why the standard has not been widely embraced and report accordingly. It should be noted that the ASQ was not involved in the "*voting down*" of the original standard; Dr Watson, whose opinions were cited by the Oudhriri et al (2022) study (*as a "reputable source"*), specifically called out that "*the ASQ were not consulted in standard development*". Mr Kubiak was asked to sit on the ISO US TC review of the standard as he is an expert in LSS.

Antony et al. (2021a) presented the pros and cons of the standard in their results, so they question why Oudhriri et al. (2022) reference their results as negative. Whether the improvements would have taken place without the strong rebuttal of the study by some members of the ISO Technical committee and the use of Antony et al.'s (2021a)

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3 study to back up the need for this revision will forever be unknown. Oudhriri et al.  
4 (2022) stated that Antony et al.'s (2021a) study was biased but reported that "*the rest*  
5 *of the 14 interviewees are not negative, many being complimentary about the*  
6 *standard", contradicting the critique of Antony et al. (2021a) for their "negative" and*  
7 *"undemocratic" views of the standard.*

10 Oudhriri et al (2022) stated, "*It is a strange conflict arguing incorrectly that ISO*  
11 *18404:2015 is about making money on certification (which it can be more correctly*  
12 *argued perhaps is the case for ASQ Six Sigma certification), whilst making a point of*  
13 *saying that there have been few certifications". This statement contradicts Oudhriri et*  
14 *al's (2022) earlier statement that "it can take many years for standard to take off "*  
15 *as a reason for few certifications but then use the fact that so few certifications*  
16 *automatically mean the standard is not about money. It was felt too expensive to*  
17 *implement ISO 18404 as a standard by many organisations who participated in*  
18 *Antony et al's., 2021a, 2021b and 2022 studies. The individual ASQ certification is not*  
19 *dependent on organisational resources to be deployed to gain the individual*  
20 *certification as opposed to an organisational-wide certification. Indeed the first public*  
21 *service organisation in the world that certified to ISO 18404 utilised consultant*  
22 *services to certify it.*

28 Oudhriri et al. (2022) state that the findings of Antony et al. (2021a) are described as  
29 "*seriously flawed", while the "Conclusions, limitations and future work" section repeats*  
30 *previous erroneous statements". As with any research study, Antony et al. (2021a)*  
31 *presented the research as they found it; erroneous statements attributed to the study*  
32 *are the viewpoint of the Oudhriri et al. (2022) authors, and we cannot respond to*  
33 *those other than to state the facts as presented in our study.*

### 36 3.6.3 SME criticism part 2

38 Oudhriri et al. (2022) stated that "*SME-specific material is not suitable for a general*  
39 *standard, but via their national committees, the ISO community would continue to*  
40 *welcome, as it always has, national experts who wish to contribute to a specific SME-*  
41 *focused standard in this field". This contradicts their earlier statements that the standard*  
42 *encompasses all types of organisations and their mention of an SME being one of the first*  
43 *certified. Moreover, do they now discuss further proliferation of yet another LSS and ISO*  
44 *standard to what end?*

## 50 4. Rebuttal of the Oudhriri study of the review of scientific methodology/approach in 51 Antony et al. (2021a)

53 Oudhriri describes the Antony et al. (2021a) methods as "*not appearing congruent*  
54 *with "either the conclusions drawn or indeed with the actual methods used" and*  
55 *states, "there were three research questions posed in the Introduction section, but only*  
56 *one is referred to in the methodology". Table 4 summarizes the references to the RQs*  
57 *taken exactly from the Antony study.*

Table 4: Extraction of Methodology section from Antony et al (2021a)

*Note that we have added **RQ** in brackets here in this study to demonstrate the alignment with the research questions.*

In order to understand the pros and cons of the ISO 18404 standard (**RQ1**) and the relevance and usefulness of the standard (**RQ2 and RQ3**), it was necessary to conduct exploratory enquiries in the form of a qualitative research approach with interviews.

The qualitative research will contribute towards understanding the ISO 18404 standard (**RQ1/RQ3**), its potential benefits or disadvantages (**RQ1**), implications of the standard as either an enabler or barrier to continuous improvement deployment (**RQ3**), changing an organisational culture towards continuous improvement, and opportunities to leverage the standard (**RQ1/2/3**).

Oudhriri et al (2022) further stated of Antony et al. (2021a) that “ *No attempt has been made properly to quantify and present the data captured, for example using Likert scales*”. Generally Likert scales are not utilised in qualitative research, so this comment is confusing. As the intention was to explore the Pros and Cons from participants perspectives, therefore qualitative study was used. In qualitative study when the intention is probe a phenomenon open ended questions(Britten, 1995; Creswell, 1999; Creswell and Cresswell, 2003). Likert scales are used in quantitative study more when phenomenon is measured (DeVellis and Thorpe, 2021).

Oudhriri et al. (2022) further added that Antony stated, “*The interviews were short and at a high level,*”; but later in the methodology contradicted themselves as it is also stated that data were “ *collected through in-depth interviews.*”. The authors of Antony et al. (2021a) state that the interviews were a “*30-minute gathering of the viewpoints specifically related to ISO 18404*”.

Oudhriri et al. (2022) highlighted that they were concerned about “*the aspect of the methodology surrounds the question about the deployment of the ISO 18404:2015 and not just Six Sigma and/or Lean in general which was, "What are the pros and cons of ISO 18404:2015?" It is clearly stated that this was the main question used during the interviews*”. Antony et al. (2021a) used this question to initiate conversation, which touched on the RQs. Please note that in Table 5, there is an extraction of the piece referred to and it is highlighted that Antony et al (2021a) asked sub-questions also.

Table 5

The interviews were short and unstructured, **with one main open-ended question in which the interviewees were asked to answer: "What are the pros and cons of ISO 18404?."** Subsequently, **we asked various sub-questions about the standard, such as the requirements for a standard and the usefulness or perceived benefits of the standard, and how well the standard could be integrated into an organisation's LSS program.** Unstructured interviews **often start with a broad, open question concerning the research question,** with subsequent sub-questions dependent on the participant's responses

(Holloway and Wheeler, 2010).

Oudhriri et al (2022) then state *"It is also noted that the sample of interviewees were specifically chosen for their extensive subject knowledge in line with Delphi methodology. However, it is also clearly stated that: "very little was known to many participants about ISO 18404:2015" "*.

Oudhriri et al (2022) cited the *"Lean Six Sigma credentials of the respondents were clearly excellent"*, contradicting their previous questioning of the practitioners' credentials as being *"biased"*. They also stated, *"however it is also clear that an "expert" opinion is captured and subsequently analysed from a group that holds no experience of the key research question."* The Antony et al (2021a) participants while they may not be *"certified ISO 18404"* are not professionals or consultants who benefited from the ISO 18404 standard uptake, they can read a standard and decide whether it makes sense and is fit for purpose.

Oudhriri et al. (2022) further criticised Antony et al.'s (2021a) research approach stating if *"the selected sample of interviewees actually knew anything about the specific research question, which for clarity, by Antony et al.'s (2021) own admission, the majority did not"*. Antony et al. (2021a) clearly stated that the RQs were to assess the awareness of the standard, so it would have been remiss of the authors to *"preselect"* practitioners well versed and with vested interests in ISO 18404. Instead, they approached neutral Lean practitioners and academics and asked their opinions. Notwithstanding that, Oudhriri et al. (2022) stated that *"it would be known to Antony et al. (2021) that there exist some experienced Six Sigma and Lean practitioners who have actually used the ISO 18404:2015 standard in practice and would have been able to provide opinions based on real-world experience; however, none of these people appears in the respondent list"*. Antony et al. (2021a) conducted an exhaustive literature review concerning the standard and found it very difficult to find anyone with knowledge of the standard either in published work or in practice. However, the participants selected by Antony et al (2021a) were from the LSS community and hence independent of the standard development and thus well positioned to present unbiased opinions.

Oudhriri et al. (2022) further admonish Antony et al (2021a) for *"not stating the sample size of interviews conducted,"* although it is clearly outlined in table 1 of Antony's study with the details of the interviewees line by line. They then state Antony et al.'s (2021) sample size in writing, stating, *"They do provide a table that shows fourteen respondents. The same number of transcribed interviews are also usefully provided as "Key findings from the Interviews"*. Oudhriri et al. (2022) contradict their own statements that there is no sample size with this quibble over a sample size not being stated quantitatively. They finally go on to tell us that *"n=14"*. Finally, in a later section of their paper, they list their own *"voices of the practitioners"* (12 in all), but they do not include a sample size nor a table

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3 summarising the 12 participants' details. In fact other than the heading "Voices of  
4 the practitioner " no background is provided on the methodology surrounding the  
5 selection of these "voices". As no interview question(s) was outlined -one can  
6 assume they are opinion pieces rather than interviews.  
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9 Oudhriri et al. (2022) concluded, based on their analysis, that "*there is no basis for*  
10 *Antony et al.'s (2021) claim that there was "an overwhelming majority" who thought*  
11 *the standard was not fit for purpose"*. However, Antony et al.'s (2021a) results  
12 summarised the interviews as transcribed, and the interviewees were  
13 overwhelmingly concerned about the standard. Interestingly Oudhriri et al. (2022)  
14 pointed out at the start of the paper that they were rebutting Antony et al.'s (2021a)  
15 highly negative viewpoints of the standard yet later in the study are stating the  
16 viewpoints were not overwhelmingly negative (while also stating Antony et al  
17 (2021a) misrepresented the findings).  
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22 Oudhriri et al. (2022) also stated that "*a simple word search of the paper reveals no*  
23 *mention or comment about fitness for purpose anywhere within the transcribed*  
24 *text."* Antony et al. (2021a) summarised the interviewees criticism of the standard  
25 concerning the comment's that it was not auditable, not easy to follow and used the  
26 term "*not fit for purpose"*. Whether this term appeared in any of the interviewee's  
27 comments is irrelevant and another superfluous point from Oudhriri et al. (2022).  
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32 Oudhriri et al.'s (2022) next reviewed or critiqued comments of interviewees from  
33 Antony et al. (2021a). Oudhriri et al. (2022) devote an entire section of their article  
34 to reviewing the interviewees' comments in the Antony et al. (2021a) study. They  
35 highlighted that "*many misconceptions were made evident within the interview*  
36 *transcriptions"*.  
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41 *Dr Christoph Roser.*

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43 First up was a critique of the contribution of Dr Christoph Roser (spelt Rosser by  
44 Oudhriri) citing Roser who had stated that "*ISO 18404 is trying to measure 'lean-*  
45 *ness'– this is impossible"*. Oudhriri et al. (2022) stated that ISO 18404 "*does not try*  
46 *to do this, and nobody else claims it does"*. Roser's opinion and interpretation of the  
47 study is his, and Antony et al. (2021a) believe he is entitled to his opinion and  
48 whether or not anyone else claims it sets out to measure leanness is irrelevant.  
49 Oudhriri et al. (2022) further cite Dr Roser's comment that "*he finds it impossible*  
50 *to audit for competencies such as motivating others, customer focus and leadership*  
51 *development"*. They then discuss that "*all the required competencies are of a*  
52 *vocational nature as opposed to academic. Space does not permit a discussion on*  
53 *all these points"*. Surely this is an important point by Roser, and Oudhriri et al.  
54 (2022) should back up their comments.  
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3 Oudhriri et al. (2022) then proceeded to “answer” Roser’s point about motivation  
4 stating, *"If a candidate knows motivational basics derived from say, Maslow,*  
5 *Herzberg, Kohn etc. and can provide practical examples, then for example following*  
6 *Herzberg, the top three motivators are a sense of achievement, recognition and the*  
7 *place of ISO 18404:2015 satisfaction of the work itself".* Many authors have written  
8 about measuring competencies and referred to Bloom, but no studies reference  
9 Maslow as a means of measuring competency. Maslow refers to the sense of  
10 achievement from job enhancement, reward and recognition -this use of Maslow  
11 does not answer Roser.  
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15 Oudhriri et al. (2022) then go on to state that *"In the UK there are a wide range of*  
16 *National Vocational Qualifications (NVQs) that follow a similar path with many*  
17 *competence requirements, there exists clear guidance for assessors on what*  
18 *constitutes acceptable evidence and what does not. It is just not that difficult".*  
19 Benchmarking of the NVQ framework of competences was not mentioned  
20 previously in any discussion of how the standard was written. Yet many  
21 publications demonstrate that the NVQ competencies are developed and assessed  
22 in line with Bloom's taxonomy. Nevertheless, Oudhriri et al. (2022) dismissed the  
23 use of Blooms earlier by Antony et al (2021a) as academic and not suitable for  
24 training. However Blooms is utilised and integrated into the one example that  
25 Oudhri used (the NVQ) to refute the use of Blooms taxonomy which has been  
26 widely studied (Akhyar, 2020; Kerka, 1992; Suprpto and Basri, 2017). Finally, they  
27 state, *"Customer focus may easily be displayed by use of KPIs, specific surveys,*  
28 *House of Quality, etc."*. However, it is unclear how to assess competency in  
29 customer focus and different levels. Any individual can produce a KPI with a  
30 customer-facing metric and “claim” customer focus.  
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40 Dr Pauline Found

41 Dr Pauline found was next on the Oudhriri et al. (2022) review list. According to  
42 Oudhriri et al. (2022), *"Dr Found asserts that ISO 9001 is sufficient and ISO*  
43 *18404:2015 is superfluous".* Oudhriri et al. (2022) stated that *"Dr Found raises a*  
44 *good point here. ISO 9001 does require performance improvement. It also*  
45 *specifically requires measurement of customer satisfaction (customer focus again)".*  
46 Founds statements are somewhat paraphrased.  
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50 Oudhri et al. (2022) then went on to state that *"However, whilst laudably requiring*  
51 *improvement, it (ISO 9001) provides little practical guidance in terms of how much?*  
52 *By when? By what methods?", By whom specifically in your organisation?".* This is  
53 stated by Oudhriri et al. (2022), given that many commentators consider the ISO  
54 18404 standard *"unauditable"*. Founds opinions on ISO 9001 as suitable *"for its*  
55 *process-based approach to PDCA"* is not discussed by Oudhriri et al (2022). .  
56 Oudhriri et al. (2022) then go on to contradict their previous statement on the total  
57 unsuitability of ISO 9001 by stating that *"It is the case that ISO 18404 marries very*  
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3 well with ISO 9001 and fills this void, enabling organisations to think much more  
4 seriously and specifically about how they will deploy their improvement efforts".  
5 Earlier in the Oudhriri et al. (2022) article, they somewhat agree with Found and  
6 her comments on the ISO 9001 standards being suitable due to its process-based  
7 approach and PDCA structure. It should that be noted that the RSS Society's Royal  
8 Statistical Society Certification Scheme for demonstrating compliance to ISO  
9 18404:2015 states "*Broadly, therefore, ISO 18404 can be interpreted as being the*  
10 *same as ISO 9001, but with the word "quality" deleted and replaced with "Six Sigma*  
11 *and Lean"*. This section validated Dr Founds earlier comments on ISO 9001 being  
12 robust enough on its own.  
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18 TM Kubiak

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20 Next up on the Oudhriri et al. (2022) review was TM Kubiak and his statement that  
21 "*the use of Bloom's taxonomy is essential*". They then stated "*Bloom's taxonomy is*  
22 *aimed at education and training, learning etc. However, the focus of 18404:2015 is*  
23 *vocational and actually, there is no requirement for training*". This contradicts their  
24 previous reference to the NVQ, and the definition of "vocational " in the dictionary  
25 is *Vocational training and skills are the training and skills needed for a particular job*  
26 *or profession* (Collins Dictionary, 2022). Oudhriri et al. (2022) then generously  
27 comment on the fact that "*Kubiak makes constructive observations about missing*  
28 *Yellow belts, and this will likely be high on the agenda for the review and*  
29 *improvement of ISO 18404:2015 in addition to other helpful observations from*  
30 *respondents*". This is despite dismissing his views earlier as "ASQ centric" and citing  
31 him "*as upset as his comments on the original standard were ignored*".  
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39 Mr. Arvind Srivastava

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41 Oudhriri et al. (2022) citing Antony et al (2021a) state, "*Mr Arvind Srivastava*  
42 *believes it is a good effort, but there is an overkill focus on competencies in the*  
43 *implementing organisation*". Oudhri (2022) state there is not a focus on  
44 competencies yet agree with the comment that the competencies in the standard  
45 are not unique to Lean and/or Six Sigma. It is of note that when Oudhriri's et al.  
46 (2022) response to Jurado, they again refer to competencies in their reply to him "*It*  
47 *is the case that as an individual progresses from Practitioner to Leader to Expert,*  
48 *then more managing and training competencies come into play. Therefore, not*  
49 *every competency is required at every level, and this was a simple way to deal with*  
50 *this*". They further elaborate "*However, the set of competencies were those that an*  
51 *expert international panel felt would be required by an effective exponent*".  
52 Oudhriri et al. (2022) quote Mr. Srivastava and state, "*Mr Srivastava states he is*  
53 *confused by the competency word in Section 4.1 of the standard. For clarity, this*  
54 *section states that key personnel responsible for Six Sigma and/or Lean in the*  
55 *applicant organisation "shall be competent" ". They state that "In practice, this*  
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3 means that the key personnel must be certified as individuals to ISO 18404:2015 in  
4 order for the organisation to progress its certification process". This, however, does  
5 not answer the concern as to how this competence is audited, measured, or  
6 demonstrated. Finally Oudhriri et al (2022) cite Srivastava's in that "he expresses  
7 concern over the ability of small companies to follow it". Oudhiri et al. (2022) then  
8 cite an example of an unnamed small company's successful deployment of ISO  
9 18404. As previously mentioned in the article Oudhriri et al (2022) use another  
10 sample of one to make a claim and generalise.  
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16 Mr. Jonathan Hunt

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18 According to Oudhriri et al. (2022), Mr Hunt " also believes that a combined Lean  
19 Six Sigma approach would be beneficial ". However, they ignore the first half of his  
20 interview, where Mr Hunt states, "dividing Lean Six Sigma in the standard is  
21 negative". Oudhriri et al. (2022) next reviewed Dr Udo Milkau's interview. They  
22 highlighted that "Milkau is supportive but points out that the standard could be  
23 improved and yes, of course, it could - and will be. ISO 18404:2015 is certainly not  
24 perfect. However, it offers stability of process, which is a key enabler of successful  
25 continuous improvement. However, ISO 18404:2015 will be improved over time".  
26 Oudhiri et al (2022) admit that ISO 18404 is "not perfect" yet author an entire  
27 paper as a rebuttal of findings on its imperfection by Antony et al (2021a).  
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34 Dr Ayon Chakraborty

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36 According to Oudhriri et al. (2022), "Dr Chakraborty provides a balanced critique  
37 that needs full consideration during the next review and makes useful observations re  
38 service vs manufacturing". Again Oudhriri et al. (2022) describe this interview and  
39 other interviewees from the Antony et al (2021a) study as balanced, given they  
40 previously critiqued the interviewees as "biased, and "undemocratic". Oudhriri et  
41 al. (2022) state that, " In practice, the two organisations that are certified in the UK  
42 are both from the construction sector. Construction is an almost equal mix of  
43 manufacturing and service. ....". This is interesting that there are "the two", implying  
44 that there are only two organisations certified in ISO 18404 in the UK. This begs the  
45 question for which Antony et al. (2021a and indeed Antony et al. 2021b and 2022)  
46 endeavoured to answer, "why so few?".  
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53 Dr Gregory H. Watson

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55 Oudhriri et al. (2022) stated, "Dr Watson (in the Antony et al (2021a) study also believes a  
56 combined Lean Six Sigma should be adopted and disputes the validity of the standard  
57 because it does not acknowledge the ASQ body of knowledge". This contradicts their  
58 earlier summary of Watson's interview statements (which were called out in table 2).  
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3 Earlier in the Oudhriri et al. (2022) paper, they stated that Watson had stated "*the*  
4 *various complaints about not covering Lean Six Sigma are spurious anyway as Lean*  
5 *Six Sigma is only a remarketing*", dismissing his claims of the standard not having a  
6 combined Lean Six Sigma stating as a "*remarketing*".  
7  
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9 Oudhriri et al. (2022) in responses to Watson's observation that the respective "*ISO*  
10 *committees of the USA and Japan voted against the standard*" respond  
11 "*Nevertheless, Japan launched ISO 18404:2015 in 2017, at which experts members*  
12 *who participated in the standard drafting from UK, China and Japan were invited to*  
13 *speak. Japan also participated in the review of the Sector Scheme (RSS, 2017) and*  
14 *recently, Japan has reaffirmed support for the standard and wishes to see it further*  
15 *developed, as well communicated on the ISO 18404:2015 standard and the RSS 18404*  
16 *Sector Scheme in the Japan Statistics Society Monthly Magazine (Ishiyama, 2020).* "  
17 This does not invalidate Antony et al.'s (2021a) paper or Watson's statement, the  
18 Japanese did not vote for the standard originally, and Watson simply stated this  
19 fact. In fact, the systematic standard review process had not been completed by  
20 the time Antony et al. (2021a) published their article. Note that the above citation  
21 for Ishiyama (2020) nor the citation for RSS (2017) cannot be found based on the  
22 references given in the Oudhriri et al (2022) bibliography.  
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28 Oudhriri et al. (2022) contradict themselves again, stating, "*The path of*  
29 *implementation once again depends largely on the level of maturity of the*  
30 *organisation. As stated in the response to Dr Rosser, it does not try to measure*  
31 *degrees of leanness (nor the "sigmaness"); however, it does seek to confirm that an*  
32 *organisation is properly and verifiably "on the Six Sigma and/or Lean journey?"*" If  
33 this is not the definition of measuring "Leaness", then what is?  
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37 Oudhiri et al. (2022) then discuss, "*So it is helpful to conduct a gap analysis of the*  
38 *organisation which will look at the current business plan, resources, Six Sigma*  
39 *and/or Lean strategy and capability and mention the RSS sector schemes (RSS,*  
40 *2017) organisational self-assessment tool (questionnaire) that covers 6 sections one*  
41 *of which is the section 6 "Body of knowledge and training"*. They then refer to the  
42 fact "that the British Standards Institute (BSI) can carry out a pre-audit gap analysis  
43 that will inform the specific path or actions required to achieve certification".  
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47 Certification pre-audits cost money, and BSI is a for-profit notified body that will  
48 charge fees for this type of pre-audit and consultancy. Hence this fact reinforces the  
49 opinions of the Antony et al.'(2021a) interviewees (as well as the subsequent Antony  
50 et al (2022b and 2022 studies) and their literature research that ISO 18404  
51 certification can be costly. While the authors of this paper accept that an  
52 organisation is under no obligation to engage a notified body, it is rare for an  
53 organisation to broach a new standard certification without some level of  
54 consultants/certification body engagement. BSI also charge an annual fee to maintain  
55 certifications.  
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59 *Voice of the practitioners*  
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3 In section 6 of the Oudhri et al (2022), they outlined opinions from various  
4 practitioners. Many opinions follow those of Antony et al (2021a) in terms of flaws in  
5 the standard and the need for improvements.  
6

7  
8 This paper's authors will not emulate Oudhriri et al. (2022) and deconstruct the  
9 interviews with their 12 participants. The practitioners are entitled to their opinions.  
10 Notably, however many have a vested interest in the standard, either being involved  
11 in its development or training or certifying organisations to the standard. Despite  
12 critiquing the detailed methodology of Antony et al (2021a) -no explanation was  
13 given in terms of how selection of the "voices of the practitioners" took place.  
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## 18 **5. Discussion**

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20 The purpose of this fourth paper on ISO 18404 led by these authors McDermott et al is  
21 to summarise the 3 published studies on the suitability of the ISO 18404 to date  
22 (Antony et al, 2021a, 2021b and 2022). The authors of this paper, also wanted to rebut  
23 and refute commentary in Oudhriri et al.'s (2022) paper concerning the academic  
24 rigour of Antony et al's (2021a) paper.  
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28 As with Oudhriri et al.'s (2022) aims, the main purpose of this paper is to make a  
29 major contribution to the debate about ISO 18404:2015. However, contrary to Oudhriri  
30 et al. (2022) in their statement that their study "*stands alone*," the authors of this paper  
31 are adding to the combined studies available with both positive and negative  
32 results and viewpoints related to the standard. Yet the Antony et al (2021a) study  
33 was cited as "*undemocratic*".  
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36 We have formally addressed the misconceptions that Oudhriri et al. (2022) stated  
37 that Antony et al. (2021a) made in their study. Unlike the Oudhriri et al. (2022)  
38 study, we have not included members of the BSI/MS006 (MS6) Technical  
39 Committee that are actively involved in the oversight, drafting, review and  
40 development of ISO 18404:2015, nor members of the Royal Statistical Society's  
41 Oversight Committee for ISO 18404:2015, nor employees of international organisations  
42 involved in ISO 18404:2015 certification activities, nor members of consultancies that  
43 benefit from training and advising for ISO 18404. In addition, we have not included  
44 participants mentioned above similar to those who participated in the Oudhriri et al.  
45 (2022) study due to their highly vested interests in propagating the standard. None of the  
46 participants in the three Antony et al. studies (2021a, 2021b and 2022) had any financial  
47 interest in either propagating the ISO18404 standard or not.  
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## 57 **6. Concluding Remarks**

58 Oudhriri et al. (2022) concluded that ISO 18404:2015 has many enthusiastic  
59 supporters, as demonstrated by the contributions of the practitioners in their  
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3 paper. However, they also commented on *“the negative overtones”* that were  
4 expressed in a paper by Antony et al. (2021a). Antony et al. (2021a) highlighted  
5 several positive comments about the standard in their study, which Oudhriri et al.  
6 (2022) recognised within their paper but contradicted later in their conclusion. This  
7 is inconsistent. Oudhriri et al. (2022) stated they in their paper *“have clarified and*  
8 *addressed these criticisms (of ISO18404) adding constructively to the debate”*.  
9

10  
11 Oudhriri et al (2022) concluded their paper stating that their *“paper emphasises, in*  
12 *particular, the importance of:*

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15 (1) *“knowledge and integrity of the ISO development process”*. This was  
16 emphasised by Oudhriri et al (2022) but is questionable given the product released  
17 in 2015 was also described by them as needing improvement and accepted there  
18 were plans to improve.  
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20  
21 (2) *“appreciation of the value of competency based assessment vs body of*  
22 *knowledge examination”*; this is questionable given that many commenters have  
23 discussed the difficulty in understanding, auditing and adhering to the standard and  
24 that Blooms taxonomy was not used to develop competencies. Also a body of  
25 knowledge related to the standard is referred by the RSS Guidance in relation to  
26 the standard.  
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28  
29 (3) *correct references to literature*. This was refuted and rebutted and  
30 evidenced as untrue (see Appendix 1).  
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32  
33 However, another main aim of the Oudhriri et al. (2022) paper was to critique the  
34 work of Antony et al. (2021a) and falsely claim bias, incorrect citations, and  
35 incorrect and unjustified methodology within the work of Antony et al. (2021a). All  
36 of the above has been rebutted in a detailed comparison of comments from both  
37 papers.  
38

39  
40 Oudhriri et al. (2022) stated, *“like many new standards, the speed of uptake could*  
41 *be improved and no doubt the standard will benefit from revisions made following*  
42 *the scheduled post launch review”*. The authors of this paper and those of Antony  
43 et al. (2021a) agree but point to the reasons why the standard was not taken up  
44 since 2015 by many organisations. Antony et al. (2021a) also recognise that their  
45 study was utilised and leveraged in the ISO systematic review discussion and  
46 referenced at the final committee review meeting to prompt revision of the  
47 standard. Oudhriri et al (2022) state further that *“Criticism of the standard based*  
48 *on unreliable interpretation from a biased selected sample of commentators is not*  
49 *helpful”*. Antony et al. (2021a) would argue that to question criticism of the  
50 standard is unhelpful and confusing. The fact that the standard is being revised and  
51 updated is evidence of the need for that criticism and the validity of that criticism.  
52 Without the criticism, which we the authors of this paper call constructive  
53 feedback, the standard would not be revised today. They further state that *“ISO*  
54 *18404:2015 was created for a purpose, and that purpose is valid”* it may be created  
55 for a purpose and may be valid, but the standard has been found to have many  
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3 flaws, evidenced by the findings of Antony, 2021, 2022a and 2022b as well as other  
4 works.  
5

6 Academic studies and works related to ISO 18404 are being duly dismissed for not  
7 suiting a script. They state that the standard is based on competency rather than a  
8 body of knowledge, so how is competence measured if that is the case? The RSS  
9 guidelines for self-assessment refer to the body of knowledge required in the  
10 guidance document (RSS, 2015). This is in contrast to the claim that "*there is an*  
11 *opportunity to bring qualification in this field up to date, moving it on from a historic*  
12 *conventional "Body of Knowledge" approach to a more modern "Competency" based*  
13 *one, in which what you can show you can do matters much more than what you can*  
14 *show you know"*.  
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17 The authors conclude this point-counterpoint study by stating that they look  
18 forward to the new revision of the ISO 18404 standard.  
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56 Appendix 1:

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Tony Bendell · Apr 23, 2018 · 3 min read



## It's Always Good to Question But It's bad to Ignore Reality

In his blog article on "[Lean Standard](#)" ISO 18404 – A Questionable Idea... Christoph Roser starts by saying that "This certification madness won't make much difference for the quality of lean."

As anyone practicing in the real world knows, the quality of much Lean implementation and training is in many cases questionable, sometimes so bad that it doesn't just waste money in implementing, but it actually makes things worse. These cases are well documented but recur frequently due to naivety, commercial interest and the absence of internationally recognised reference standards.

Any 'cowboy' can do Lean, consult in Lean, contract in Lean or train in Lean. And unfortunately, there are many customers out there, individuals and organisations, who do not have the knowledge, experience or insight to differentiate good from bad Lean. What is good or bad Lean is, of course, a matter of opinion but broadly the professional and academic communities do have consensus, for example seeing isolated use of Blitz Kaizen without adequate preparation or follow up as unlikely to be successful. And yet it still goes on, on an extensive scale, since much of the market knows no better.

Similarly, anyone who understands Lean knows that a Lean practitioner needs lots of additional skills and competences over and beyond knowledge of Lean tools. They must be able to manage stakeholders, often project manage improvement, find appropriate data to measure current performance, lead and manage a team, motivate, communicate, and

manage their own development. That's for starters. But, so much Lean training is only about tools.

And organisations also lose their way. I have seen many organisations (as, I suspect, we all have) where, having set up a Lean programme of activity, they then forget exactly how it fits in with corporate objectives and think about it just as about cost savings, where key people have been trained by different providers and there is a lack of coherence and even conflict within the approaches, and where the programme limps on ineffectively in the background with management attention having moved on.

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4 All of this is why the international standard for Lean and Six Sigma, ISO18404 was created. A  
5 standard gives a reference point, an aspiration to improve management and performance,  
6 and something once got, that management doesn't want to lose, hence empowering the  
7 Lean champion, like the Quality Manager, to keep the organisation's eye on the ball. You can  
8 implement a standard badly within an organisation, but that is not a reason to condemn such  
9 standardisation. Do it right instead.  
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13 Later in his article, Christoph says he finds it difficult to understand how to audit required  
14 competencies. He asks "How do you, for example, audit 'motivating others', 'customer  
15 focus', and 'leadership development'?" Well, it isn't difficult. The reason that practitioners  
16 are assessed on competencies under ISO18404 is that in this field, what you can do well is  
17 more relevant than what you know in theory. Competency based assessment, following  
18 much good, well established international practice, is based on a combination of submitted  
19 documentary evidence of having done it previously for real, and an interview process at an  
20 assessment centre.  
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24 Christoph believes that money is the reason for the new standard being created, and, in a  
25 sense, I agree with him. And, I will add, vested interest. Most national standard bodies  
26 supporting ISO standards, such as BSI in the UK, are government or not for profit. ISO itself  
27 is an independent, non-governmental international organization with a membership of 163  
28 such national standards bodies. Many, if not most, accredited certification bodies who certify  
29 standards such as ISO18404 are also not for profit. There is, however, as we know a for-profit  
30 sector in current training, certification and consultancy in Lean. Whilst these are in no way  
31 prohibited from continuing operations by the creation of ISO18404, they and their clients  
32 now have an internationally agreed reference point to work around.  
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37 Christoph thinks that the current certification issue is less of a problem for Lean than Six  
38 Sigma. I am less sure. A quick google search shows innumerable Lean certifiers and  
39 certificates on the web, some good, some less so. And use of Google Trends shows that  
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