Towards a common understanding of standards?

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Abstract

If universal principles of conservation are to be discussed effectively a common understanding of standards should be established. This paper offers a vocabulary of standards and introduces a method to describe them. The paper reviews the development of standards identifying the relationship between the origin of a standard and its resultant approach. It uses pairs of keywords to describe distinctive features of standards and uses five word pairs to examine and compare national standards in the UK and China. The process of understanding standards and describing them precisely enhances efficiency through improved communication.

Introduction

The concept of standards is like 'good company', or 'a beautiful view': easy to recognise but hard to define. This paper investigates our understanding of standards, both in their terminology and the meaning that they confer. Clear definitions of standards exist but whether the term confers the same meaning to different people is questionable. The paper considers the origins and implementation of standards and offers an extended vocabulary and a model of description that could contribute to a more aligned description and understanding of standards. It also offers an opportunity to broaden our appreciation of the role of standards and thus increase their impact.

Standards are important in that they promote efficiency, quality and innovation [1], they are the products of compromise: we abandon uniqueness to conform. Standards can be compulsory or voluntary and their origin influences their implementation. Cassar and Keene [2] describe standards based on their geographic influence. A museum could use international or national standards or their work could be governed by an internal specification operating as a standard. In order to make comparisons this paper focuses on national standards for collections care.

Case studies

In the UK a concern for the creation of standards in collection care has existed since the 1970s [3] resulting in comparatively more standards than in China which is beginning a process of defining and developing standards. Reviews of Chinese museum collections under threat due to poor collection management in the early 2000s [4] and the publication of Thomson's The Museum Environment in Chinese [5] have been an impetus to standards creation. The resulting schemes in China are in a trial stage.

What is a standard?

A standard is a document to consistently measure ways of producing objects, processes and services. Standards help

to ensure uniformity and reduce complexity [1], they give us confidence to follow a common method and make it easier to make decisions [6]. Standards are built on the consensus of current best practice that incorporate the experience, opinions and expertise of all interested parties [7]. In common parlance the term 'standard' can be used in a variety of ways and can be defined in relation to a wider jurisdiction, their content or how they were formed.

Talking about standards in conservation

The scope of preventive conservation is broad and there are many practices that can be described as 'standard'. Within the narrowest meaning, only published formal standards with a serial number should be referred to as such. A more general meaning can include all the public or non-public, formal or informal documents that regulate the care of objects and established traditions, conventions or customs whether or not they are in a written form. For example, in any culture behaviour in relation to occasions such as birthdays or weddings can be described as 'standard practice' without the existence of any formal definition: this can be described as a standard-based approach [8]. Standardised practice also exists in more formal and documented contexts including manuals, specifications, procedures, etc. Broadly speaking, law and policy can also be categorised as a standard. An insistence on a tight definition of standards may generate a pleasing sense of precision but may reduce effective communication and understanding. Recognising standard-based approaches widens the scope to be considered when seeking to change, improve or consolidate practice within collections care.

Standards in context

Standards are detailed and more flexible than laws and policies, their relationship is like a pyramid (Figure 1). Laws can underpin the implementation of standards by providing a regulatory framework. Laws represent the state's interest and citizens must comply. Policies are made by governments, organisations, companies, etc., to manage the institution's internal activities. Policies guide people to operate within the constraint of the law. Standards are detailed to provide technical specifications to support policies and laws. Normally standards are voluntary, but when identified in law, they become compulsory.
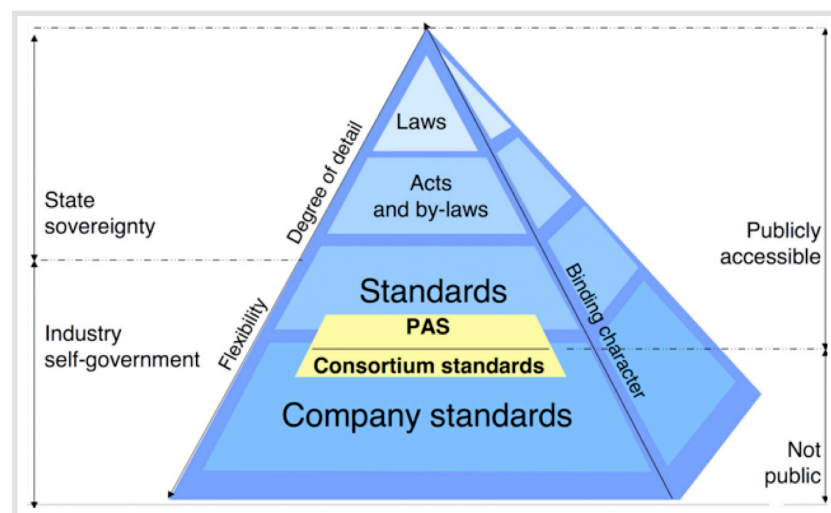

Figure 1. Standards within the legal system: the hierarchy of regulations [9]

Content of standards

Based on their contents, standards can be categorised into four basic types: measurement standards; process standards; performance standards; interoperability standards [10]. Each of these types can be found in collections care.

Measurement standards

Measurement or metric standards are used to measure ordinal values such as the size of clothing or volume measurements. These standards are useful for manufacturers producing products and for customers purchasing them [10]. The words and numbers used in these standards are unambiguous and precise. Many collections care standards describe performance using measurable standards such as 50 to 60 % RH.

Process standards

These prescriptive standards aim to provide normative activities or processes. They supply the 'methodology to perform tests and perform processes in a consistent and repeatable way' [10]. These standards describe the sequence of an operation. An 'Oddy test' is a standardised process to evaluate the suitability of materials for inclusion in display cases [11].

Performance standards

Performance-based standards are fundamental to benchmarking [6]. They may set several levels of behaviour to encourage individuals to aim for the highest. For example, in Japan following the Hyogoken-nanbu earthquake of 1995, the Building Standard Law was revised to prescribe performance requirements based on earthquake response [12]. Thomson offered both Class I and Class II environmental standards to be applied dependant on the nature of the collections, building and institution type [5].

Interoperability

Interoperable or compatibility standards are set for two or more different activities to ensure they use the same method or specification. The process and performance are not prescribed but a fixed format is required [10]. For example, the designs of keyhole and key are interoperable. When considering digital preservation, both the digital artefact and an interoperable system of software and hardware must be preserved to ensure that the digital artefact can be accessed.

Combinations of content

Some standards can represent more than one typology. For example, the UK standard single bed size is 36 × 75 inches. Utilising clear measurements it is also performance based, because its size is suitable for a person and it is interoperable because the mattress fits the bed. For a registrar operating an international art loan these different standards approaches could arise. The loan conditions may specify measurable environmental targets set at several degrees of tightness. Testing of display case materials according to the Oddy test protocols may be included in the facilities agreement as may a plan to ensure that any

environmental logging systems travelling with the loan items could be read and interpreted by each venue.

Origin of standards

If we categorize standards according to the process by which they are created, the basic types are de facto and de jure standards [13].

A de facto standard, evolved by a market process, is widely accepted and used, having achieved a dominant consensus position without approval from any official body, while a de jure standard is established by an official standards organisation and is promulgated by a government agency [14]. These categories represent two groups of stakeholders involved in the evolution of standards [15].

De facto standards emerge from consensus and competition; the winning standards will represent the emerging dominant technology [15]. A winner-takes-all approach to the emergence of de facto standards will result in the elimination of competitor systems such as the battle between VHS and Betamax. A de facto standard can be sponsored by an organisation or can be unsponsored such as the QWERTY keyboard.

De jure standards do not necessarily represent consensus in the market. The 'winners' are those selected by authorising bodies. Although de jure standards avoid competition costs they rely on judgement for selection and there may be a gap between the priorities of decision makers and practitioners [15].

Both de jure and de facto standards can be based upon evidence generated by research to support their specification. The process of creating a de jure standard may begin with specially-commissioned research and a de facto standard can evolve from the wide-spread acceptance of the conclusions of research. Conversely, a determined politician could impose a de jure standard regardless of the evidence; poor practice, with no evidence base, can evolve into a de jure standard in the way that superstitions grow. The practice of collections care is best served by those standards that are based on relevant research and evidence whether this is research commissioned specifically for the purpose of standard creation or evidence created by research simply inspiring a standardised response.

By considering these aspects of standards (jurisdiction, content and formation) it is apparent that although simple definitions can be offered, standards vary greatly with consequent variation in their

Table 1. Summary of categories of standards

Application or Jurisdiction	Type of Contents	Formative process
Corporate in-house or organisational standards	Measurement standards	De facto standards
Society or Industrial standards	Process standards	De jure standards
National standards	Performance standards	
Regional standards	Interoperability standards	
International standards		

impact (Table 1). Where a response to a collections care problem is the development of a standard, an awareness of this variety and a developed vocabulary will assist in an effective process of standard definition and implementation.

Standards and semantics

Once the variability of standards or standards-based approaches is accepted, the challenge that arises is how to represent and understand this. Ashley-Smith [6] offered seven pairs of polarised words to illustrate the diversity of standards. This concept has been adopted and extended here to develop a methodology to portray variability and to enable discussion about how this may impact on the uptake and operation of a standard. From the initial seven pairs, the authors created 23 pairs of words to highlight dichotomies within standards (Table 2). These pairs are grouped into categories which reflect: the elasticity of standard design; measurement methods; reasons for standardisation; compliance regimes; formative process and application.

Pairing serves to highlight the breadth of concept embodied within the simple term 'standard'. Any word pair can be used to evaluate a standard along an imaginary scale between them. For

Table 2. Semantics applied to standards

1	Broad scope	Narrow scope	Degree of tightness
2	Universal	Local	
3	Generic	Specific detailed	
4	Flexible	Rigid	
5	Risk	Certainty	
6	General directions	Fixed numbers	
7	Evangelism	Pragmatism	
8	Process	Technical	The measurement methods
9	Outcome	Output	
10	Minimum requirement	Good/Best Practice	
11	Compatible	Self-dependent	The motivation for standardisation
12	Uniform	Diversiform	
13	Impartial	Unfair	
14	Objective	Subjective	
15	Evidence based	Lacks evidence	
16	Guidance	Coercion	Binding characters
17	Enable	Punish	
18	Self-assessment	External force	
19	De facto	De jure	Formative process and application
20	Evolved	Imposed	
21	Market	Government	
22	Public	Non-public	
23	Long period	Temporary/ Provisional	

Figure 2. Representation of standard variability using spider graphs

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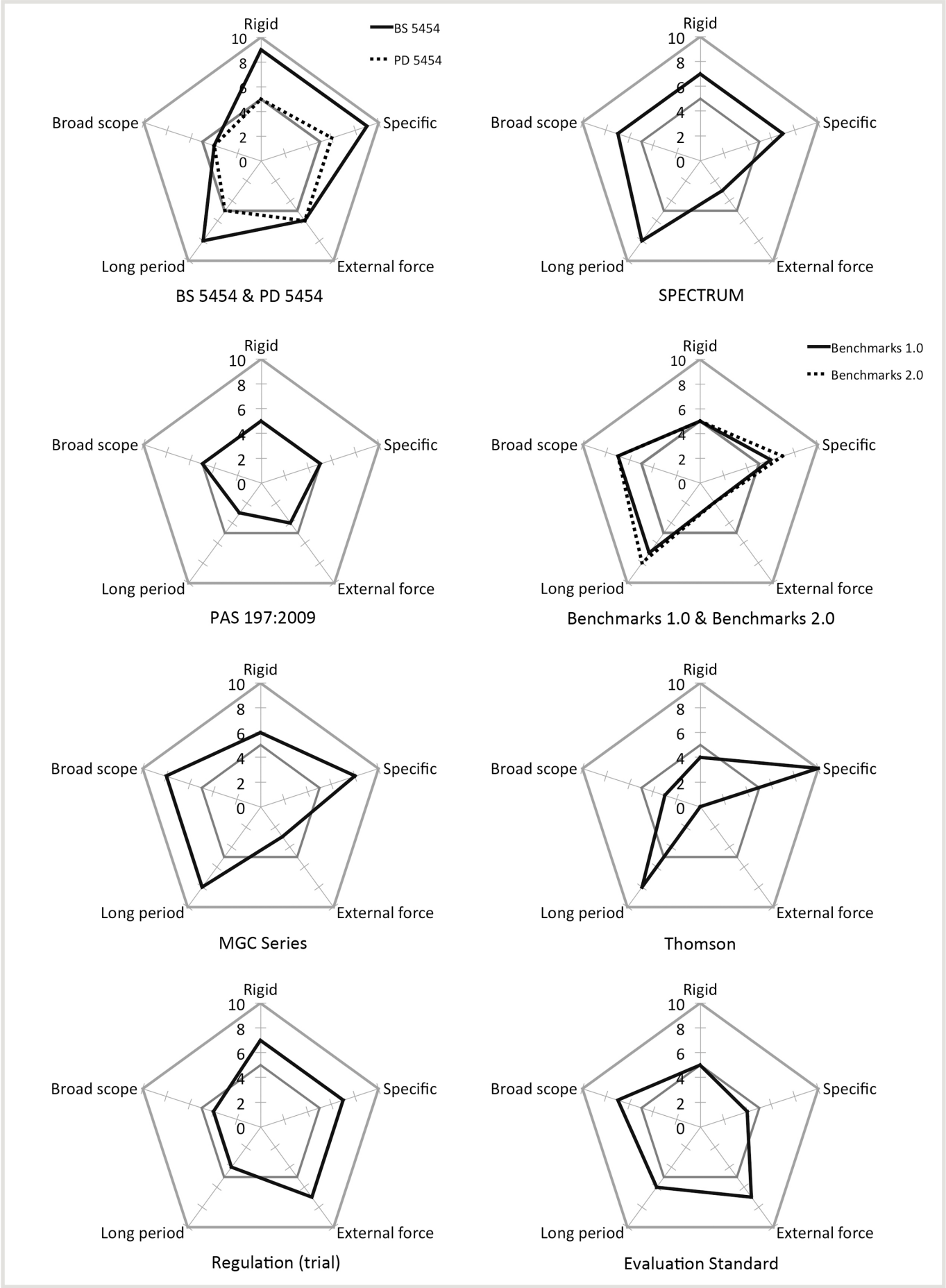
the purpose of this paper, to examine UK and Chinese standards, five critical word pairs were identified. By eliminating concepts that were pre-determined or beyond the scope of the study and word pairs which represent an inherently correct position the list was narrowed. Word pairs that were most descriptive and applicable to a museum context were chosen. Although a comparison of the degree of pragmatism or risk approach would be insightful, the authors concluded that in comparing the UK with China the pairing of flexibility – rigidity offered the most culturally neutral evaluation.

Spider graphs

Each of the five word pairs chosen can be plotted on a spider diagram (Figure 2) using judgement to place each standard at a point between the pairs.

1. Broad scope   Narrow scope
2. Generic   Specific detailed
3. Flexible   Rigid
4. Self-assessment   External force
5. Long period   Temporary/Provisional

For some of the pairs it may be presumed that a midpoint creates an optimal standard. For example, it can be a disadvantage for a standard to be too flexible or too rigid. For others, such as longevity, an appropriate time scale may relate to the stability of the context in which they apply. The pairings are offered as a tool kit to dissect standards, to represent and highlight how different approaches may work in a given context. It is not intended that the pairings selected for this study would be the best in another but this methodology of representing the variety could be used elsewhere.

Analysis of museum standards

Eight UK-based collections care documents from the last 35 years were selected for study. These texts include benchmarks and guidelines that go beyond the technical description of standards. Two Chinese standards for collections care in museums were considered. As these standards are undergoing a trial implementation their scaling is based on an understanding of their operation in four Chinese Museums (Wuhan Museum, Xi'an Ban Po Museum, Shanghai Museum and Capital Museum). This range of documents was selected to examine their variability considering their different nomenclature and origin.

BS 5454:2000 Recommendations for the storage and exhibition of archival documents and PD 5454 Guide for the storage and exhibition of archival materials (UK). BS 5454 was a de jure standard in its simplest sense. It had a narrow scope defined in its title. With a clear focus, the requirements were specific and detailed. With rigid, unambiguous provisions and fixed numbers it has elements of a measurement standard and is consequently easy to understand. BS 5454 was used for official inspections so an institution could lose recognition if it failed to comply. In 2012, PD 5454 superseded BS 5454, offering guidance on the preservation of archives, although it offers a wider scope. Compared with the BS, PD 5454 is more flexible in a range of contexts making it easier to apply whether the collections are mixed or vulnerable, in all seasons, in historic buildings or in a purpose-built repository. PD

5454 provides fixed numbers but these are set in a range with explanations; it offers solutions and has detailed guidance. The document is more persuasive than its precursor. PD 5454 is not a 'British Standard', but its potential is huge as it replaces BS 5454. Recently launched, it may not be updated soon.

PAS 197:2009 Code of practice for cultural collections management (UK). PAS 197 is described as a specification with a narrow scope concentrating on collections management, it is concise and systematic. The standard has some flexibility and is not based on coercion. PAS stands for Publicly Available Specification, which means it could later become a 'British Standard'. PAS 197 was scheduled for review two years after its completion.

SPECTRUM museum documentation standard (UK). Described as the UK museum documentation standard, SPECTRUM contains 21 procedures and many more 'sub-procedures'. This process standard covers object documentation and activities such as condition assessment, prescribing the priority of actions. SPECTRUM is specific and certain and has spurred museums to undertake large information management projects. The standard contains minimum requirements. Established by a public body, its procedures are incorporated in the UK Museum Accreditation Standard [16]. Since its inception in 1994 it has been widely accepted in the museum industry in the UK and internationally operating both as a de jure and a de facto standard.

Benchmarks in collections care for museums, archives and libraries (UK). Identified specifically as a benchmarking, not a standards, document this publication describes three levels of performance for collections care against which institutions can self-assess. Collections care is a broad concept involving a wide range of activities influencing the preservation of objects. Benchmarks contains many recommendations but does not force the institution to complete them; the provisions are pragmatic with detailed scope offering a self-assessment approach supporting staff to improve performance. Based on several precursor documents, Benchmarks was published in 2002 and revised in 2011. Benchmarks represents a de jure approach that has evolved and become more detailed over 15 years.

MGC standards in the museum care series (UK). These wide-ranging standards first published in 1992 comprise eight booklets covering a series of specific collections types published by a governmental advisory body, the Museums and Galleries Commission (MGC, now MLA) [17]. They contain detailed requirements describing best practice in process and performance but there is no enforcement regime. The standards are rigid and specific, guiding non-experts to implement them. The requirements are relatively high, containing some specific measurement-type targets requiring significant resources to achieve them. Despite the dissolution of their sponsoring body, these standards still have relevance in the UK museum sector; they have transitioned from a de jure to a de facto standard. Without external force, these strict standards are unlikely to be applied consistently.

Thomson's The Museum Environment (UK). This universally acknowledged de facto standard for collections care describes environmental parameters for museums. Many countries applied

the standards contained within the book with varying success. Although there is no external force to impose implementation this book became a touchstone of good practice resulting in the enforcement of its Class A standards through de jure routes such as BS 5454 or de facto methods such as international loan agreements. Creating a long term consensus in the market, the book's specific and detailed contents eliminate doubts and encourage acceptance of its recommendations. It is a good example of how standard practice can emerge from a source which does not comply with the traditional definition of standards.

Regulation on Museum Collection Conservation Environment in Trial Implementation (China). This regulation is a de jure standard produced by the standard-making committee of State Administration of Cultural Heritage (SACH) in China. This is a technical standard used to regulate museum environment conditions for collections storage, display areas and conservation labs. The provisions are measurable, specific and rigid, for example, specifying store size without reference to collection type [18]. Some clauses offer more general guidance. This is a minimum standard document. In its evolutionary stage imposing the standard may be dangerous. However, in practice, museums undertake the project with support from the experts from SACH who conduct inspections and offer further guidance whilst encouraging museums to complete the implementation.

Museum Evaluation Standard (China). The Museum Evaluation Standard is also a de jure standard of SACH. It has three performance grades. Museums are awarded Grade 1 by achieving a total score of over 800 points which does not require the museums to meet the entirety of the highest grade [19]. The Evaluation Standard is assessed by committee. It focuses on processes such as the management of infrastructure and facilities, collections management and research, exhibitions and services. It also contains elements of a measurement standard, for example, offering scores against specific numbers of (undefined) 'precious collections' [19]. This is an interesting case of a non-specific measurement standard. It is planned that the standard will last a long time and will be revised and updated every three years. For museums applying to the scheme, there will be the external pressure of supervision and assessment by the government. Museums may lose their accreditation status if they cannot maintain the scheme. The standard is pragmatic but lacks precision.

Discussion

Of the ten documents considered four are formally defined as standards although only BS 5454 has specific recognition as such. Others defined practice later adopted by standards and others have the potential to one day evolve into a formal standard. All offer advice, guidance and definitions against which collections care practice can be measured and improved. It is possible to split these documents into two categories depending on whether or not they are formal standards but this distinction may be one of the least interesting to make.
Considering the graphs, for several of the pairs a median point on the scale is a baseline and deviating from this raises questions about a standard's efficacy. The more extreme the scaling the more challenges there may be in implementing it. Plots for PAS 197:2009, PD 5454 and Chinese Museum Evaluation Standard

are closest to the median points suggesting they offer balanced achievable approaches. Standards which demonstrate greater rigidity or specificity will be harder to implement. If they are supported by a strong enforcement process they may be enacted, perhaps with resentment, but without external force their implementation may be perfunctory. Broader scope will tend to increase the areas to which the standard applies and therefore increase the resources required to implement it.

The Museum Environment is a special case. It played a unique role in the early days of environmental standards when it defined the pinnacle of knowledge and was adopted in the absence of any alternative. In today's more crowded market a specific and rigid standard with no enforcement might expect to have less impact.

It is useful to consider the range of museum institutions attempting to adopt these standards: specifically comparing those with reasonable environmental conditions and staff expertise with those with fewer resources. Standards which lack any extreme score may generally experience a good rate of take-up due to their more voluntary and generic nature offering some detail and flexibility. However, for institutions with fewer resources these more generic standards may require professional support to be effective. These smaller less well-resourced museums may welcome the lack of detail and enforcement but this may allow weaker aspects of practice to continue unnoticed. Those museums provided with professional support may be able to use median point standards to create good outcomes. Larger museums with a stronger starting point of conditions and expertise also have the awareness to improve themselves. For these museums, standards which offer clear statements in an achievable framework are challenging and can lead to improvements without external force.

Chinese collections care standards

The two Chinese standards whilst pragmatic do not offer a full spectrum of detail so aspects of collections care such as documentation are not discussed. Standards for different types of collection or museum are not yet in place in China. Adoption of de facto standards from abroad with an established consensus and reputation could help avoid adverse unintended consequences related to the adoption of new specific standards.

SACH aim to regulate all museums in China [20] but this will take time and their priority appears to be raising minimum standards, perhaps at the expense of driving improvements in best practice. Although the Evaluation Standard defines attainment levels, these utilise vague terminology such as 'proper' and 'effective', offering less specific guidance. A reliance on written standards can mean that those museums operating at best practice levels have an underused potential to be used as benchmarks for all Chinese museums.

Conclusion

Mapping standards across word pairs is a tool to dissect their varied nature and spirit. Considering those standards that have endured but been revised, it can be seen that the pressures of sustainability, pragmatism and professional review have led towards the median points on many of the scales shown. As

Chinese museums implement a more consistent approach to collections care they may find that the balance between detailed rigid approaches and generic ones becomes easier to achieve. We have seen how elements of The Museum Environment have operated as a standard and how documents offering levels of practice, whether described as benchmarks or standards, can increase a sense of attainability.

The concept of standards can be as simple or as complex as anyone wishes to consider. In this paper we have analysed the concept in its broadest sense in the belief that the common understanding of 'standards' goes far beyond a narrow technical description. When defining and improving practice in collections care, operating with this broader conception offers the benefit of greater impact and clearer communication.

Acknowledgements

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