Values are the key: drivers of separation and co-operation between different communities of practice

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Keywords: large technology heritage, industrial heritage, community of practice, values, conservation

Introduction

People who restore large technology heritage items often assume that they are all doing the same thing, and because they assume they are doing the same thing, they judge each other by their own standards. In fact, they are not doing the same thing at all, and what is considered good work in one community because it meets the needs and expectations of that community, may be considered poor work in another community that has different needs and expectations.

Etienne Wenger (1998, 45) defines a community of practice as a social group that is "created over time by the sustained pursuit of a shared enterprise". Communities of practice, he says, arise wherever a group of people need to co-ordinate their work practices and social relations in order to get things done, and they are defined not by formal memberships but by mutual engagement and negotiation of meaning. Becoming part of such a community involves not merely the learning of intellectual and technical knowledge, but also of the social practices associated with that community (Lave & Wenger 1991). Wenger suggests that this is not a formal learning process, but "a process of being active participants in the *practices* of social communities and constructing *identities* in relation to these communities [emphases in original]." "Such participation," says Wenger, "shapes not only what we do, but also who we are and how we interpret what we do" (1998, 4).

According to this view, becoming an accepted and respected member of an occupational community involves more than just learning its technical skills and concepts. It also involves accepting the attitudes and behaviours of that community and internalizing its shared standards and preferences, its language and mannerisms. Lave and Wenger emphasise that members of such communities will always have different interests and viewpoints and will make different contributions to the community, so they are not suggesting that, through joining a community, members will become identical copies of each other. Rather they argue that community members come to "share understandings concerning what they are doing and what that means in their lives and for their communities" (Lave & Wenger 1991, 98).

These observations about communities of practice are very relevant in the context of large technology heritage, as the size, complexity and cost of large technology projects inevitably mean that they are team projects, requiring input from many different areas of expertise and therefore multiple communities of practice. In fact, the entire enterprise of preserving large technology heritage can be seen as a team effort

involving multiple communities, as large technology heritage is, and always will be, held by both public and private owners. Public collecting organisations are usually expected to be representative of a range of technologies, time periods and sectors of society and therefore they can generally afford to have only one, or at most two, of any single type of large technology object. Smaller, volunteer societies and private owners have far more liberty to focus on tightly defined areas of interest, preserving a number of machines from just one type of technology, one context, one period, or any other aspect of personal or community relevance. The preservation of a variety of types, meanings and histories in large technology heritage is therefore likely to depend upon the distributed efforts of many different organisations and people, who will have diverse approaches and goals in heritage.

The many different people involved in large technology conservation and display generally share a commitment to preserving and promoting the machines, but their different backgrounds often lead them to see each others' approaches to large technology heritage as unsatisfactory, ignorant, or even negligent. Such philosophical and practical divisions among people working with large technology heritage can cause significant barriers to co-operation, and sometimes outright conflict. This paper will look at the reasons behind some of these philosophical differences, and how the concept of values might be used as "neutral ground" to encourage exploration of each other's assumptions and the generation of new collaborative understandings that can lead to innovative solutions to the needs of machinery in heritage contexts.

As well as theoretical research the paper will draw on recent research in Australia exploring people's attitudes to the preservation and display of large machinery heritage. Data for this study was gathered through face-to-face interviews at eight sites within Australia that display large technology heritage: Western Australian Museum—Maritime, Australian War Memorial (the Memorial), Melbourne Museum, Scienceworks, Puffing Billy Railway, Campbelltown Steam and Machinery Museum, Automobile Restorers Association Gold Coast, and, for comparison, Darling Harbour – a leisure site that does not have heritage displays. A pilot study was also conducted at the National Museum of Australia.[1]

Discussion

In Australia it is common for people to join their first professional community of practice in their late teens or early twenties as they leave school and begin tertiary, apprenticeship or on-the-job training. This is a key period in a young person's life and development: research has shown that things learned and events experienced in the period between 10–30 years of age (and especially between 15–25 years of age, peaking at about age 20) are likely to be remembered more positively and more often, and perceived as having greater emotional intensity, than anything but very recent memories, a finding that has been termed the "reminiscence bump" (Conway & Pleydell-Pearce 2000, Rubin, Rahal & Poon 1998, Bernsten & Rubin 2002).

[1] Further details of the study methodology, data and analyses can be found in Alison Wain 2014, *Size Matters: Seeing the Values in Large Technology Heritage.*

The reminiscence bump is remarkable because it runs counter to the normal trend for memories to decay fairly uniformly with time (Anderson 2010). David Rubin, Tamara Rahhal and Leonard Poon titled their 1998 paper "Things learned in early adulthood are remembered best," and this appears to be true for information from a broad range of areas and contexts, the bump being found to affect autobiographical memory, memories of cultural, social and political events and eras, and factual and semantic memory (which broadly covers general knowledge and understanding of the world). The reminiscence bump has also been found to exist in a number of different cultures (Conway & Pleydell-Pearce 2000).

In relation to the current study, this suggests that the knowledge and values that people carry with them from their early vocational communities of practice will remain influential, and will carry through to their participation in other communities of practice, and other professional situations, in their later lives. A number of large technology heritage producers provided examples of this, as they noted the formative influence of their early (non–heritage) training and experiences on their later approach to heritage. Andrew Schroeder for example, Large Technology Conservator at the Memorial, described the influence of his initial training as a mechanic on the way in which he continued to make a first appraisal of an historic object:

> One of the things I think I bring to conservation because of [being a mechanic] is that the first thing I look at when I look at anything technical… is how is it designed to work? And how is it constructed?

Eamonn Seddon, Chief Executive Officer of the Puffing Billy Railway, described the impact of his initial training in theatre on his vision for the visitor experience at the Railway:

> My background before I got involved in playing trains was in the theatre. I was a professional actor, stage manager. And you go to the theatre to have an experience, you read a book to have an experience, you go to a film to have an experience. Why not go to a railway to have an experience? So it needs to become far more than a train trip.

John Boardman, a private owner of tractors at the Campbelltown Steam and Machinery Museum, described demonstrating — for heritage purposes — skills that he began learning as a child on his family farm and then reinforced through a formal apprenticeship as a young man:

> I'm a plant mechanic — did my time with Caterpillar, 18 years on the spanners, then started operating which I'd done part time since I was a kid. . . The old bulldozers—you've got to stop and put it in gear… The old drag line — it's like trout fishing… You demonstrate an old art and when you get it running right it just seems natural and easy, but people don't realise how much is involved in doing it.

The formative influence and persistence in memory of learning from late adolescence and early adulthood may well be the reason that many producers of large technology heritage tend to approach their objects from the point of view of the values and approaches of their first occupational community of practice, regardless of whether

their object, their organisation, or their visitors, are best served by that tradition in the new heritage context. Producers who trained first as conservators, curators, engineers, tradespeople, industrial archaeologists and others all have distinct community traditions of ethics and practice, and as these traditions have served them well in previous situations, they have come to believe that they are the "right" way to do things, both in a practical sense and, to some extent, a moral sense as well.

The most obvious of these divisions is between those who feel they belong to the community of engineers and those who feel they belong to the community of conservators. Large technology has only recently come to be seen as an area of heritage that offers particular challenges and requires specific training, and there are still relatively few people who have formal training in both mechanical or engineering skills and materials conservation. People with engineering backgrounds are therefore frequently hired to carry out conservation work on large technology heritage items regardless of whether they have any formal conservation training, while conservators are frequently drafted into looking after large technology items regardless of whether they have any understanding of machinery, or any familiarity with the challenges presented by big objects. We will therefore look at the influence of these two areas of training on attitudes to large technology conservation in more detail, beginning with an exploration of the influence of engineering and mechanical training, and following with an exploration of the influence of conservation training.

The influence of engineering and mechanical training

People with mechanical or engineering backgrounds typically have a good understanding of the needs of machinery in service, but as John White – Senior Curator of Military Heraldry and Technology at the Memorial – explained, they generally have relatively little understanding of the demands placed on machinery in a museum:

> I think engineering expertise is useful with large technology objects, but it brings with it such major problems about the conservation of an object as a historic item… Because applying an engineering approach to an object to one of those historic [large technology objects] can mean that you can effectively wreck it in 12 months… [Wrecking it meaning] that you look at an object and you wouldn't know the difference between it and a fullscale model. [Eliminating] all the things that make an object real and all the things that tell you, in the first hand, about how it was built and operated and its history…

Conservators, on the other hand, typically understand the materials of which the machine is made very well, but have little idea what the actual machinery is or what goes on inside it, as Andrew McVey – private owner of a steam traction engine at the Campbelltown Steam and Machinery Museum – pointed out:

> Our biggest museum in Sydney is the Powerhouse… One of the conservators there [was talking about] "that big green thing over there and that small black thing over there"… They could preserve it and it was in a nicely controlled environment but they had no idea what they were looking at.

Schroeder, who trained first as a mechanic and later as a conservator, explained his view of the differences between the two approaches:

> The conflict is… about what you're trying to do… The premise for… a mechanic [is that] their customer wants [their] car to go well. So if it needs major work you will ask them [for permission], but you will [also] do things that maybe are not 100% necessary, but [that] will enhance their experience of it… As a mechanic, you learn that most of the stuff you do people can't see, so their impression of what you have done is based on what they can see. So you do these things that aren't necessary. [Even for minor things.] If it's broken you always fix it, or suggest that it should be fixed.

According to Schroeder, for a mechanic the desired result is a satisfied customer, and if the customer does not know enough about the vehicle to understand the improvements that have been made to the hidden parts of the vehicle, mechanics will often fix or adjust something that is not strictly necessary—but that the customer can see or feel for themselves—to increase the customer's confidence that work has actually been done and improvements made. For a conservator, however, the desired result is preservation of as much of the historical evidence of the object's life as possible, and such mechanics' "confidence boosters" are seen as confidence tricks—unnecessary and dishonest alterations to the historical evidence embodied in the object.

For people who were initially trained as mechanics, and who begin working with historic mechanical objects later in life, these two different approaches set up a conflict that has to be worked through and resolved, either by moving to a new set of values, or by integrating the two different approaches into a new and more nuanced approach to the preservation of historic machinery. Schroeder described this as a non–intuitive process that generally required explicit discussion and exploration of alternative options, either through a formal teaching course, or through workplace mentoring:

> The conflict for me… was dealt with while I was training, at an intellectual level. But… people [like volunteers] who come direct from trade background to this sort of work, I can see them working through the conflict as they are working… it was often hard to get [the volunteers at the Memorial] to stop and record what was wrong and ask 'What should we do about this?' Rather than just jumping in and going "I'll just fix this bit" as a natural thing to do. But because I did the course at university… it was always the ethics [you considered]. The "How do we do this? What are we here to do?"

The engineering tradition is also focused on understanding and appreciating the way the object was designed to function. When the object has become "heritage" the original utility of its function is usually no longer practically or commercially important. Instead it has a new "heritage" purpose, which many engineers see as being to embody and express engineering ingenuity and technical progress. Each object provides a demonstration of the status and achievements of engineers, both as individuals and as a community of practice. For Steve Gower, Director of the Memorial, this record of progress and achievement could be seen in the carefully controlled, stepwise development of military weapons:

> When you start… you test the prototype and you say "Right… [we] will… freeze the pattern [at], say, a Mark 1." Then you do more trials and you say, "Hey, that didn't work… We'll have another [design] program." This will be Mark 2 or Mark 1 star or something... I've seen missiles: P10, P20, P38, P41. They're all different modifications, for a good reason, because something has a weakness and you've enhanced it. And this thing might [be modified] like that it's whole life.

This interpretation of the significance and meaning of technology objects is so fundamental for the engineering community that in 2008 Peter Godfrey, then National President of Engineers Australia (EA), in the opening sentence of his foreword to the guide to EA's Heritage Recognition Program, defined the rationale of the program as follows:

> Recording the history of engineering and ensuring the conservation of engineering heritage works play important roles in establishing engineers' professional standing within the community (Engineering Heritage Australia 2010, 3).[2]

For engineers, a technology object that is in working order, or as close as possible to working order, is felt to be better able to represent and honour the history of engineering progress and achievement than one that is not in working order, as Schroeder described:

> My preference is to have them working because that is one of the things that speaks to me, that it is a working thing… That is what it is for when it comes to technology, it is for a purpose and it achieves that purpose by functioning. If you take away the function then you are distancing yourself further from what it is about… [And] if people in the future do want to investigate the past, then if it works… they are going to be in a better position to understand it than if it doesn't.

From this point of view an object that does not function is damaged or incomplete, and of lesser worth than a similar object that does work. For an engineer, a damaged object is not adequate for its original purpose, and neither can it satisfactorily represent that original purpose as heritage. White explained:

> … an engineer would often have some considerable difficulty viewing a damaged object as being legitimate. They would wish to repair it because their entire training has directed that a damaged item is flawed, possibly dangerous, and certainly is unsatisfactory in terms of what they expect to achieve in working on an object… you can have conversations with people with that background and they can't understand why you would want to conserve damaged material… It was also believed, from that background, that the best way of preserving an object was to apply the kinds of techniques which were associated with an operational object; in other words removing paint,

[2] This version of the Guide to the Engineering Heritage Recognition Program has been superseded and is no longer available on the EA website.

> neutralising corrosion, repairing all structural damage, repainting, refitting, re-machining, and ending up with something that looked like an object, or in fact performed like an object which could be operated. That… cuts very deep. If it doesn't work, there is a problem with it.

For an engineer or mechanic, to leave a machine in a damaged, dirty or even just shabby condition goes against their vocational training and implies neglect or betrayal of the standards of their community of practice.

The influence of conservation training

By contrast, the materials conservation tradition views the object as a witness (Muñoz Viñas 2005). Conservators' training and codes of ethics teach them that the physical fabric of the object, and any service-life alterations to that fabric, should be preserved as documents that provide evidence of the eras and events through which the object has lived.

The heritage assessment methodology outlined in the publication Significance 2.0, which is designed for use by both public and private heritage owners, includes the question "Does the condition of the item make an important contribution to understanding its use, history, creation or development?" (Russell & Winkworth 2010, 49). A sample answer to the question in relation to a large technology item is provided in the statement of significance for the Clayton and Shuttleworth steam traction engine which says: "The engine shows evidence of its hard working life and some post-manufacture adaptations to enhance its operation and to equip it for other work, such as chaff-cutting" (Russell & Winkworth 2010, 51). The Australian Institute for the Conservation of Cultural Material (AICCM) Code of Ethics, which both reflects and influences the professional standards of conservators in Australia, takes a similar position. Item 33 (Appropriate Treatment) states that: "Evidence of provenance and of the history of the cultural material should be preserved" (AICCM 2002).

Maggie Myers – Objects Conservator at the Western Australian Museum - Maritime – commented:

> I think generally in conservation we are more aware of what the total history of an object tells us and that we don't remove things unless we are sure that that is what we have to do.

Myer's use of the pronoun "we" implies a sense of being part of a community with clearly defined values that members are expected to uphold. These values are explicitly inculcated in conservators during their training, and learning them is part of the process of becoming part of the conservation community of practice, as Schroeder explained:

> The first part of every subject [at university] would be a discussion of what the ethics of conservation are and what conservators are here to do and how you approach a treatment… [It was] related to the AICCM code of ethics, a prescriptive list of "conservators don't do the following things."

Documents of heritage standards and methodology rarely discuss any requirement to preserve or restore the functionality of an object, and even if they do conservators may disregard them. Barbara Appelbaum observes that, despite the fact that the American Institute for Conservation (AIC) Code of Ethics instructs conservators only to perform treatments that "do not adversely affect cultural property or its future examination, scientific investigation, treatment or function"(AIC 1994, Section VI), in practice conservators tend to ignore the mention of preserving function as it conflicts with the commonly held conservation principle that physical use causes objects to deteriorate, and should therefore not be allowed (Appelbaum 2007).

Moreover, an historical event which may have stopped an object functioning is often regarded by conservators as the most historically significant event in its life, and physical evidence of the event is seen as a high priority for preservation. The Japanese midget submarine on display at the Memorial, for instance, was deliberately scuttled by its crew when it became trapped in Sydney Harbour, a suicidal action that prevented either the submariners or their craft falling into Australian hands in working order. From the perspective of a conservator, and indeed many curators, to restore functionality to such an object would be to remove a major part of the significance that makes the object worthy of preservation as heritage, as well as a feature that gives it drama and pathos as a display.

The changes required to restore either the functionality of an object or a semblance of an earlier appearance are also viewed with concern by conservators. John Kemister, Large Technology Conservator at the Memorial, commented:

> I think that's the biggest thing in dealing with these relics, is being faithful to the relics. By that I mean not changing them. The moment you undo a nut or a bolt, you're changing it, so even just doing that simple action you've got to be very careful about why you're doing it… Is there a little bit of paint evidence under the head of the bolt? Is what I'm doing damaging the relic, or is it going to be providing more of a benefit than a detriment to the relic?...We need to be faithful to the things that we're dealing with here because very often, other than the documented stories behind them, the only concrete evidence we've got of the history of a particular relic, is the relic itself.

This concern for the object itself is a guiding principle of the conservation community of practice, and while conservators may recognise the need to modify the way they treat objects to accommodate display requirements, or restricted budgets, or alternative ideas of the "best" way to preserve heritage, they often feel personally guilty about such compromises and worry that they will be judged negatively for their actions, both by their peers and by future generations. As Schroeder said:

> . . . it is always going to look as though it was my [fault]. Certainly if people read the treatment report, they are going to think that I am the person who chose this route. . . I shouldn't really be worried what people in the future think of me as a person, or as a professional, as long as I am comfortable with what I have done, but it's hard not to feel that people will think that I have done a bad job.

While not specifically talking of concerns about technological heritage objects, Appelbaum (2007) has also discussed the guilt and worry often experienced by conservators when they feel unable to reconcile the practical needs of heritage with the idealistic ethics of the conservation community. Communities of practice are supportive, but they also require support in return. To belong to such a community, and to have status within it, members have to respect and share its values and participate in its enterprises. This is a personal investment that becomes part of a person's identity. It is not lightly cast aside, and continues to inform that person's life and actions beyond their engagement in that particular community of practice. As Wenger notes (1998, 57):

> . . . your colleagues are there too, looking over your shoulder, as it were, representing for you your sense of accountability to the professional standards of your community.

The role of values in resolving differences between communities of practice

The approaches described above are not intrinsically good or bad or right or wrong. They are merely different. They are strongly influenced by the values and perceptions that producers of large technology heritage bring with them from their pasts, and in particular the skills, approaches and social attitudes in which they have been immersed during the formative period of late adolescence and early adulthood. They come from different perceptions of value and they achieve different results.

Values are fundamental to people's identities. They are the product of a lifetime of learning and experience and underpin an individual's self-esteem and social relationships. If people feel that accepting a different method of treating or displaying large technology heritage means abandoning their own values and substituting someone else's, they will be understandably reluctant to accept that new method and will fight to defend their values and what they see as right.

On the other hand, the very ubiquity of values means that they are potentially a common point of reference—people may hold different values, but the knowledge of what it is to have values, and to look to values as a source of guidance and justification, is something that they share. Values provide a personally relevant basis for understanding why other people do things differently from ourselves – it is not that they are incompetent, or insensitive, but that their actions are driven by values to which they are as deeply committed as we are to our own. Understanding this common commitment should give us a joint foundation for collaboration, with the aim being to respectfully share our different values, discuss why they are important to us, and reach a more explicit understanding of how they influence what we would like to do or communicate with our large technology heritage.

One of the challenges of developing new ways of working, however, is to get people with entrenched viewpoints to talk to each other. The integration of different values and practices into a shared, holistic understanding does not always happen spontaneously. Wenger (1998) notes that crossing boundaries between different communities of practice means entering regions where there are few guidelines and fewer models. These are regions where it can be hard to know what competence

means, either socially or technically, and therefore hard to know how to judge the worth of new ideas, the expertise of members of other communities of practice, and the potential outcomes and consequences of adopting new practices. Some people actually thrive in this environment, preferring to continue creating new connections rather than move to the established core of any one practice, but while this makes them ideal change-brokers, it also means that they are rarely typical of a group or community of practice, and rarely at the social centre of it. They operate, in fact, at the boundaries of multiple groups, and acceptance of their ideas can therefore be affected by issues of trust and legitimacy, as well as by their tendency to introduce challenging and sometimes negative information.

The formation of new, cross-practice teams therefore depends on developing an ongoing dialogue that allows new ideas to be explored and trust to be developed. Fortunately, large technology heritage is not the only area of practice that encounters these problems, and dialogue methods have been developed to help diverse groups address these issues of trust and mutual respect, encouraging them to negotiate openly with each other with the recognition that their values are equally worthy of consideration even if their positions in organisational or knowledge networks are very different.[3] These processes of dialogue and value analysis need to become accepted as a standard part of the way large technology teams do their work. Each team, and its organisation, needs to become familiar and comfortable with a process that suits it, and to embed that process (or multiple processes) into a continuing conversation.

Negotiating new, shared meanings and values is a process of imagination, of seeing potential and envisioning change. Hugh Glassie argues that this is a sign of professional maturity, the point where experts bring depth and renewal to their community of practice:

> To be useful [experts] must go beyond their narrow disciplinary expertise into other territory where they are amateurs. This transdisciplinary stage happens as they mature as [experts]. They keep technical rigour, but embrace new disciplines (Glassie 1999, 5).

Daniel Miller (2008) expresses this as a process of bridging existing, often apparently incommensurable values, to find a new balance, a point of intersection that reflects a new understanding of quality based not on absolute fulfilment of the values of any one area, but on the incorporation and melding of values from a number of different areas. Miller gives the example of a quality object being "something that is seen as embodying the…complex resolution of competing factors" (1129) and suggests that even new forms of monetary and asset based value are "most effectively created by people who find new ways to link different worlds" (1130). In the context of large technology preservation and display this suggests that the process of exploring our diverse values, finding bridges between them, and using them to develop new definitions of quality will be a driver for new communities of practice to coalesce around the challenges of large technology heritage, using both old and new knowledge to generate innovative solutions to unusual and intriguing problems.

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[3] A brief list of dialogue methods that have particular relevance to the management of large technology heritage are described in Appendix C7 of Wain 2014, *Size Matters*.

Conclusion

There are many different technical and cultural approaches to the preservation and display of large technology heritage. At present, however, many of these approaches remain in "silos", used and appreciated chiefly by one particular group or community and ignored, avoided or even derided by others. Research has shown, though, that creative partnerships are being generated between people from different communities of practice who work to set aside their pre-conceptions about what is "right", "wrong", "appropriate" and "inappropriate", and focus instead on re-imagining what is possible, sustainable and inspirational in large technology heritage.

Recognition of multiple values in heritage has come, in recent years, to be seen not just as a pragmatic way of dealing with potential conflict, but as a positive way of enriching the understanding and experience of heritage. The use of values as a common reference point for understanding different approaches to large technology heritage has the potential to facilitate not only a more creative melding of different skill sets, but the discovery of new ways to make such heritage sufficiently exciting, thought-provoking, and relevant for people to keep visiting it, and collaboratively looking after it, for generations to come.

Author

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