Agile standards

1. Foreword

Agreement powers progress everywhere. In the world of industry, government and society, a consensus approach will strengthen policy delivery, innovation, commerce and international relations. Standards, codes and norms are agreed ways of doing things and, with the right governance, offer a neutral, systematic, outcome-driven form of agreement that represents a consensus view of good practice. Formal standards which are technology agnostic, patent free and publicly available provide an essential point of reference for business, regulators and consumers alike.

Today we all know that change is ubiquitous and this means that the way by which we reach agreement on standards, codes and norms needs to adapt. We need to be open to new thinking and innovation as it emerges and we must respond to new risks and threats. Seeing standards making as a dynamic, agile process for all stakeholders is an exciting concept. It means tapping into expert communities in a completely new way to the past, agreeing on the latest good practice, sharing this quickly and then testing, refining and improving the information in a rapid, value adding process.

To be truly agile, good practice should support the most valuable use cases as they emerge over time. This means being flexible, iterative and responding quickly as circumstances change. To succeed, agile standards development should be open and inclusive with thoughtful and independent facilitation.

This paper is an important contribution to the debate over how standards making can adapt to a new, faster paced world where best practices need to be shaped and refined by stakeholder communities in a form of "dynamic consensus". The paper investigates the challenges and opportunities for everyone involved and offers guidance on when agile standards are most suitable and where they can deliver greatest value.

Scott Steedman CBE, Director-General, Standards, BSI

The task of developing a standard requires openness, thorough scrutiny, constant challenge, rigorous tracking, and establishment of consensus. It is about management of relationships as much as it is about technical detail.

Any process for developing standards needs to consider each of these elements. This paper doesn't fight shy of the difficulties which need to be accommodated in introducing a more agile – and potentially more inclusive – approach. It doesn't claim to identify a panacea. But it does identify tangible steps for moving forward in the development of standards in a more timely and appropriate way.

Anne Kemp OBE, Chair, UK BIM Alliance

2. Executive summary

This white paper explores an exciting new direction in the future of good practice – the potential to take an "agile" approach to the development of standards. It considers what is meant by, and included in, an agile approach and where applying this could be beneficial. This includes examples of applications in the built environment, and the paper briefly touches on some of the associated challenges and limitations.

In the sections below we address a series of important questions:

- What is driving the need for increased agility in shaping good practice?

- What are the potential benefits of developing standards using agile approaches?

- What are agile standards (that is, what do we mean by standards that are developed in an agile manner)?

- How does this compare with traditional approaches?

- What are the main applications for agile standards?

We explore how the need for greater agility relates to major trends from digital transformation to the response to climate change and COVID-19. These trends are driving a requirement for increased speed and flexibility in capturing agreed views of good practice.

In turn, we consider the benefits of this agility. These include reducing the time to realize value from good practice and using rapid iteration to ensure that standards provide an up-to-date point of reference.

It is also important to understand what is meant by agile standards, to inform thinking on their uses. This paper looks at the principles of agile standards development, key features, opportunities, risks and limitations. We also compare agile vs traditional approaches and consider when each may be suitable – in some cases a traditional approach may still work best.

Finally, but crucially, we investigate the applications for agile standards. These include supporting early and continuous innovation incorporating technology testbeds and trials, rapid response to major shocks, and supporting regulatory innovation. To help bring this to life, we have included examples of how agile approaches to developing standards are being applied today.

BSI developed this paper in close collaboration with the Construction Innovation Hub, which helped enable the work by combining knowledge from across its partner organizations. The Hub brings together world-class expertise from BRE, the Manufacturing Technology Centre (MTC) and the Centre for Digital Built Britain (CDBB) to transform the construction industry. The ideas expressed in this paper are informed by in-depth discussions with stakeholders at BSI, and representatives from across the Hub's partner organizations, as well as desk research and wider market engagement over the past year.

In particular CDBB's National Digital Twin programme (NDTp), whose mandate is to enable an ecosystem of connected digital twins – a National Digital Twin, will explore and develop the issues set out in this white paper with active discussion with its online digital twin community through the Digital Twin (DT) Hub. The DT Hub, together with BSI has, over the last year, begun the early groundwork on standards for digital twins with research and the publication of a landscape report on existing standards as well as publishing a standards roadmap for digital twins. The publications were coupled with a series of engagement activities with members of the DT Hub as well as the wider digital twin community. The results from these activities have highlighted the need to take an agile approach to the development of a standard outlining the concepts and principles related to digital twins for the built environment. This has also informed many of the considerations set out in this white paper.

3. Drivers for increased agility

Put simply, standards are an agreed way of doing things, based on consensus. They represent the latest thinking on good practice. But, when that thinking is fluid, or changing rapidly, then a more agile approach to developing standards may be needed. This section explores the drivers for this agility, and some of the potential benefits, before we go on to consider the characteristics and applications of agile standards.

The need for agility is driven by major trends and recent events. Digital technology and connectivity are leading to rapid sociotechnical transformation. This impact is multiplied by the requirement to adapt to climate change and the new, and pervasive, challenge presented by COVID-19. The pace of change is fast and good practice needs to adapt at the same rate.

By contrast, standards are typically seen as offering clarity and consistency. However, the methodology traditionally used to develop standards does not necessarily offer agility. This section of the paper considers the main drivers and benefits of a more agile approach.

We are not suggesting the creation of something new and untested. Rather, we can look at the evidence found in the software development industry, where agile methodologies and DevOps (which combines software development (Dev) with IT operations (Ops)) have delivered high quality working code, continuously at scale. This paper sets out how we can learn from such techniques and apply them to the world of standards.

3.1. A need for speed?

Is the perceived need for greater agility in standards development all about speed? Or is it more complicated than that?

The pace of innovation adoption has certainly accelerated with each industrial revolution. From steam power, to the internal combustion engine, computing and now cyber-physical applications, the time to get from innovation to majority adoption has shrunk from decades to years; while today's individual apps and products can start to gain wide traction in weeks or months.

The software industry is at the forefront, pushing out minimum viable products (MVPs) at an early stage of development that attract interest and generate feedback which quickly feeds into the next release. This iterative approach is used for more established products and services too, with a rapid succession of releases that are implemented almost instantaneously. Fast, iterative approaches have also rippled out from the digital arena to impact a wide range of industries.

But this new way of working is about flexibility as much as pace. Businesses need the ability to customize their products, re-purpose production lines or re-imagine established items. In the built environment this includes, as examples, innovation in construction products and prefabricating elements of buildings and infrastructure, as well as the use of digital tools and services. Processes, policies and frameworks also need to adapt to respond to new opportunities and threats. Flexibility is needed in stakeholder engagement too, given that many innovations cut across traditional industry boundaries and come from new players as well as established actors.

Agile approaches to developing standards are a way of remaining relevant and delivering value by matching this speed, dynamism and flexibility. Then, if the agreed view of good practice can readily change in response to an evolving market, standards can continue to act as a valuable and up-to-date reference point, even at times of great uncertainty and change.

3.2. Potential benefits

Many of the desired outcomes from more agile standards development mirror those from more traditional approaches. These benefits include:

- Enabling consistent, high-quality, processes, products and services

- Supporting interoperability

- Increasing trust and confidence in new approaches and innovations

- Improving the resilience of industry

- Improving the performance of products and services

- Facilitating a faster route to market for industry innovations

Some of the differences between agile and traditional approaches are then about how these outcomes are achieved. For example, if the market is changing rapidly, then what was seen as high-quality a few months ago may not be today. Or if lots of new concepts are emerging then terminologies may need to adapt quickly to provide a common language that supports continued communication and interoperability. Agile standards can also act as a rallying point for innovators and disruptors looking to collaborate in a growing market or to bridge the risk gap between developing a new solution and implementing rapidly at scale.

In each case, new iterations or versions of standards may be required so that these continue to offer an up-to-date reference point that, where consistently applied, can increase trust and confidence in the market.

In addition, gaps in agreed good practice where consensus is still emerging can make the evaluation, procurement and use of new products and services costly and challenging – for both buyers and sellers. Traditional standards, while good at supporting the adoption of more established innovations, might struggle in these emerging spaces – and this is an important driver for agile approaches.

The ability for agile approaches to provide a quicker way of capturing agreed practice can reduce the time it takes to realize value from a standard. This could be attractive to smaller organizations in particular, who often can't afford to make long-term commitments without seeing some kind of return. Iterative approaches can also reduce up-front costs by concentrating effort into short "sprints". In addition, agile standards are sometimes offered free at the point of use – this helps to encourage use and testing of the standards and it also reduces implementation costs.

These and other applications and benefits are explored in more detail in the sections below.

4. What are agile standards?

In essence, a standard is an agreed way of doing something. It could be about, but not limited to, making a product, managing a process, delivering a service or supplying materials – standards can cover a huge range of activities undertaken by organizations and used by their customers.

Standards cover a wide range of subjects from construction to nanotechnology, from energy management to health and safety, from cricket balls to goalposts. They can be very specific, such as to a particular type of product, or general such as management practices.

The point of a standard is to provide a common basis for people to share the same expectations about a product or service. This helps to:

- Facilitate trade

- Provide a framework for achieving economies, efficiencies and interoperability; and

- Enhance safety, consumer protection and confidence

Within this broad landscape, there is no single definition of an agile standard – agility can mean many different things, for example:

- Agile methods of development, including the use of sprints

- A flexible approach, based on principles of development, but with a dynamic process

- Agility around the use of the content within the standard; or

- Agility in the use of tools and collaboration spaces to support participation

The use of the word "agile" itself can also be problematic and has the potential to cause confusion. Therefore, in trying to answer the question "What are agile standards?" it is easier to consider the core principles that would allow them to respond to the needs outlined so far in this paper.

4.1. Principles of agile standards development

The key principles of agile standards development are as follows:

1. **Iterative development:** dynamic updating of content to respond to the changing market environment, providing the most up-to-date picture of agreed good practice at that point in time. Iterations and incremental versions made available for use allow for regular "check ins" with end users to assess suitability and encourage feedback.

2. **Modular approach:** where the standard is built-up as a series of elements over time, with an initial focus on areas where consensus can be reached quickly, and the ability to "park" more tricky areas for later development.

3. **Deriving value at an early stage:** accelerating the point at which usable content of value is made available to end users. Avoiding wherever possible the "time lag" involved in more traditional methods of standards development, when it can take months, or even years for consensus to be reached on a suitable output. The incremental steps provided by the iterative development, incorporating early user input, combined with the accelerated point at which usable content is made available provides a significant advantage over traditional methods (see Figure 1 below).

4. **Flexibility:** the timings of standards versions are built around external factors, rather than pre-determined milestones. Flexibility to move at the same pace as the market, with more rapid iteration during periods of rapid change and less frequent updates as understanding matures. Flexibility to align with specific pilots and testing.

5. **Inclusivity:** as the pace of technological change increases and standards are developed within shorter timescales, it becomes even more important to encourage and secure participation from all interested parties. New methods of engagement and collaborative working are essential to reduce the barriers to participation.

6. **Outcome focused:** an agile approach may not be appropriate for highly prescriptive standards. Conversely, in areas where good practice is still unclear and there is a high level of uncertainty, it may be more appropriate to focus on outcomes and principles, instead of requirements.

Figure 1. Value of agile standards development
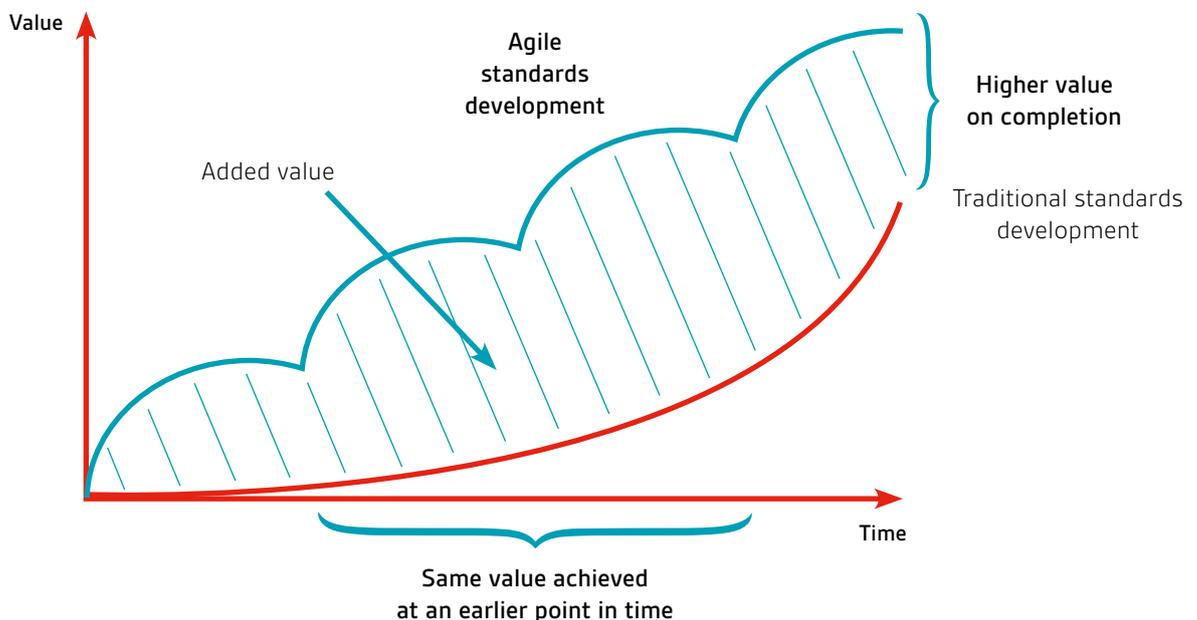
4.2. Key features

Agility in standards development relies on greater flexibility and speed, but to ensure the resulting standards are robust, trusted and of high quality, it is important to retain some of the characteristics of more traditional standards development. The table below shows the features that agile standards may have in common with more established routes, and also where agile approaches may start to build on these features.

In common with established approaches to standards development	Enhancements to, or divergence from, established approaches to standards development
• **Consensus**: agreement on the scope and technical content of a standard • **Participation**: an opportunity for all interested parties to contribute and have their say • **Governance principles**: to ensure that participation is balanced, decision making is robust and the output is credible • **Functional structure of the content**: designed to work as a standard and is developed with a specific outcome in mind • **Fits within a wider standards landscape**: complements and supports the purpose of other standards	• **Iteration**: smaller milestones delivering value earlier and more frequently • **Consensus**: option to "park" components that are not ready for a decision and review in the next iteration; potential for modular updating • **Flexible timescales**: alignment with external milestones and events, e.g. pilots • **Flexible process with governing principles**: different options for taking work forward depending on industry needs and maturity of the knowledge • **Dynamic group of users and makers**: changing composition over time • **Enhanced communications**: clarity around current status, what will be happening next, what may change, version history • **Working environment**: Tools and approaches to support collaborative content development

5. Relationship between agile standards development and other forms of standards development

5.1. Standards and certainty

Existing methods of developing standards are well suited to disciplines and challenges where there is well-established and relatively mature agreement around good practice, for example, for the safety of products. The cycles for the revision of standards are measured in years, rather than months or weeks and this allows for gradual refinement and a controlled and steady level of change. This approach is particularly valuable where there is a need for certainty and stability in good practice to allow for planning and investment cycles, particularly where the costs of implementing and complying with standards are significant.

In contrast, more agile approaches add value where there are still significant levels of uncertainty and the potential for disruption around good practice, for example where there is a need to iterate and test new concepts and approaches as innovations continue and understanding matures.

As seen in the implementation of DevOps, there is a need to understand the risks of balancing flexibility with certainty, and this can lead to a change in the way risk is managed. The outcome is that the service reliability of the products can improve as risk can be managed at the appropriate level of detail. This is a key consideration for enabling the improvement of performance for the products that these agile standards will serve.

Agile standards development provides greater flexibility to respond and adapt to rapid and significant change in areas of uncertainty. There are a number of scenarios that help us to consider when agile approaches are more, or less, suitable, including:

- **Disruption to existing good practice:** in some circumstances it may be appropriate to start from the "solid base" of traditionally developed standards and apply an agile approach to further development to tackle a particular challenge or disruptor

- **Ongoing change:** change may continue indefinitely, but there will sometimes be a need for industry to have a stable standard to reference, a "master" version, which is updated on a modular basis as threads of agile standards development test and resolve specific challenges

- **Increasing certainty around good practice in an emerging area:** over time, certainty around good practice will increase, and the need for flexibility will decrease along with the frequency of updated versions. At this point, more stable mechanisms would be preferable

In any of these scenarios, an agile approach should respect and accommodate any underlying cycles of planning, investment and testing, and work to support these, rather than to cut across them.

Whilst there is a clear role for agile standards development in emerging and dynamic areas, it is not appropriate in all circumstances and it is important to consider the key risks and opportunities this new method can present.

5.2. Key considerations: risks and opportunities

How is consensus impacted by working within an agile environment? Working within shorter timescales and with frequent and repeated opportunities to review and agree new content can change the practical aspects of reaching consensus. Shorter timeframes for consensus building require additional caution to guard against the loudest voice in the room; by contrast, shorter timescales can encourage participation from those who may have been dissuaded previously by the long timescales needed to produce something usable, leading to a better quality debate at an earlier stage. Without doubt, the consensus building process has different characteristics within an agile environment and requires careful facilitation to ensure that each version of a standard is robust and a reflection of agreed good practice at that point in time.

Should people trust and rely on something that is likely to change? Clear signposting and communication around the status of agile standards is essential to manage expectations around the longevity and likelihood of further changes to content. Understanding the onward trajectory of a particular standard will in turn help organizations decide how and when to use the standard, for example, is it appropriate to reference a particular standard within a contract if it is likely to change within months? It could be enough to simply have visibility of the direction of travel and the key areas of uncertainty and contention at a particular point in time. The process of early and transparent debate encouraged by an open and iterative process can help to build confidence and familiarity with new concepts and risks. As the standard matures and the cadence decreases, firmer decisions can be made around investment and planning.

How does an agile approach align and support more mature areas of work? "Bolting on" agile approaches to more mature standards programmes without considering the consistency and uniformity of the standards themselves could lead to confusion and conflicting approaches. It is also important to look at the interoperability of the systems and processes the standards will cover, as well as the overall goal for a particular programme. For any standard, agile or otherwise, clarity around the problem to be solved is essential, and this should always be considered in the context of the wider standards landscape and market needs. For any given area of standardization, it should be possible to partition particular problems or challenges that would benefit from an agile approach, whilst also considering how this contributes to the bigger picture. Agility with clear intention and context is extremely powerful, whereas perpetual cycles of change for the sake of it can be counterproductive, costly and a challenge to resource given the open-ended nature of the process.

Introducing agility into established areas, for example core processes for an existing type of product or service that is being delivered at scale, could also lead to significant effort to implement change. Equally, there may be understandable reticence to apply agile approaches to standards which may influence certain aspects of health and safety as this might introduce new risks. However, even established areas need to adapt when circumstances change and sometimes this needs to happen with great speed and agility.

The need to adapt is one of the applications of agile approaches explored in the section below.

Will agile exacerbate skills gaps? Agile ways of developing standards, combined with wider use of digital technologies, create many opportunities. However, some organizations, for example smaller and more traditional organizations in parts of the built environment supply chain, may lack the skills and capabilities needed to fully take advantage of these new approaches - and risk falling behind. For example, the development of agile standards may involve more online collaboration and use of digital tools. The move towards agile standards therefore strengthens the imperative for all types of organizations to get the support needed to develop these capabilities.

6. Applications for agile standards development

There are a wide range of use cases, or applications, where agile approaches to standardization could be beneficial. Based on a series of one-to-one discussions as part of the research for this paper, and wider engagement with the market over the past year, these can be grouped into at least three different areas:

1. Supporting early and continuous innovation
2. Rapid response to major shocks
3. Supporting regulatory flexibility

6.1. Early and continuous innovation

Early-stage innovation is typically characterized by high levels of uncertainty, and risk, which can act as a brake on adoption. New ideas are continuously emerging, and many organizations respond by trying to set out their own, sometimes limited, view of "best practice". However, these siloed attempts to describe what "good looks like" can, ironically, increase rather than reduce the level of fragmentation in the market. This makes the task for buyers more complicated and means suppliers must work harder to demonstrate the suitability of their products and services.

Capturing a shared view of the latest, emerging good practice could help buyers and suppliers to have a consistent point of reference – for example to help feed into procurement processes. However, there is a risk, perceived or real, that creating standards at an early stage could stifle creativity. These standards could also quickly become out-of-date when the market continues to innovate.

An agile, or iterative approach to standardization could address these challenges by combining early-stage consensus through rapid development of an MVP view of good practice with flexible iteration as the market evolves.

One way of thinking about this is to consider what type of approach might be suitable at different technology readiness levels (TRLs). TRLs were first conceived by NASA in the 1970s, and span from basic research (TRL 1) through to full-scale implementation at TRL 9. This initial idea has also evolved over the years and has even been captured in the ISO 16290 standard.

Agile approaches to standardization could provide an initial view of good practice at low TRL levels, and then provide the flexibility to update good practice as technology matures over time.

Another way of thinking about this is to relate agile standardization to the S curve for technology maturity. Movement along each curve shows incremental innovation, whereas the steps between curves indicate more significant change, like, for example, a completely new medium for data storage or a new mode of transport. Iterations of agile standards could help ease, or accelerate, the path along the curve from R&D towards maturity and higher adoption. Such flexible approaches to standardization could even be useful in making the shift from one curve to another, at times of truly disruptive innovation – though the level of change here could be so great that even the most dynamic approaches might struggle to keep up in the short run.

Figure 2: Potential for agile standards to support innovation

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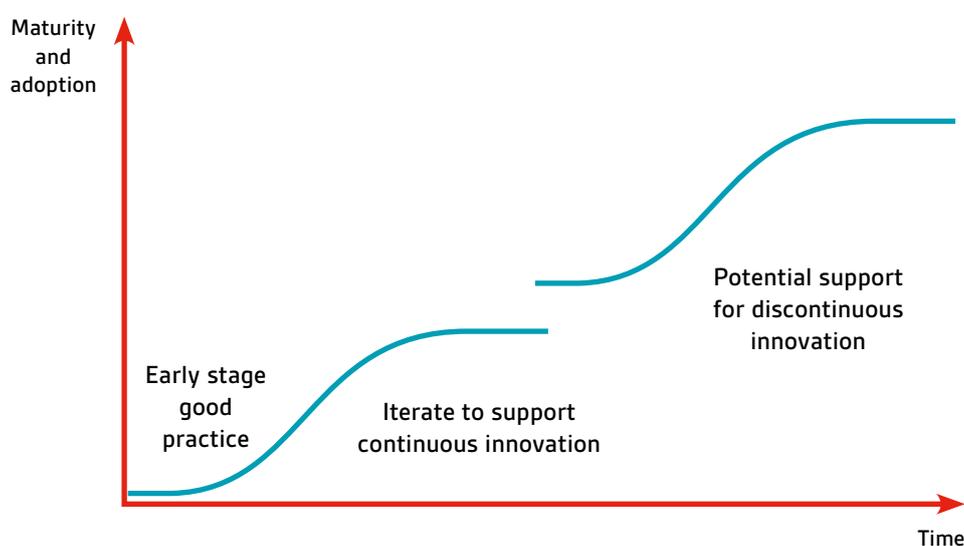
6.1.1. Support for testing and trialling

More specifically, this approach can support innovation programmes, including those backed by government and accelerators, where lots of different organizations are testing and trialling over time. Agile approaches could then help to:

- Provide early guidance on underlying principles ahead of trialling

- Capture what worked well from the first round of trials and agree on common aspects of good practice; and

- Test this thinking in subsequent rounds of trials

- Which then feeds back into improvements in the standard, for the benefit of the trialling organizations and the wider market

This approach could be applied across all sectors and in a wide range of programmes, from innovation in construction materials and techniques, to smart manufacturing and agritech. Trials effectively provide a sandbox environment to test out agile standards, and new iterations can reflect the evidence gathered.

An alternative perspective also emerged during our one-to-one research. Some felt it might be easier to iterate good practice once a technology or concept has become more established. At that stage, there would be a greater level of understanding in the marketplace and stakeholders should need less time to get up to speed. However, this introduces another potential challenge – the maturity itself might make it harder to introduce new and iterative thinking. In which case, more disruptive approaches might be needed to make progress, which might trigger a leap to the next S curve.

Case study: dynamic vocabulary for connected and automated vehicles (CAV)

Challenge: There was a lack of consistency around CAV terms and definitions, with potential to cause confusion and risk. This is an evolving area, with ongoing innovation and thinking on key terms can change regularly, making them difficult to reference. A dynamic approach was needed to develop an agreed vocabulary of terms that can act as an up-to-date point of reference.

Approach: BSI worked with the Centre for Connected and Autonomous Vehicles (CCAV) and industry to develop a CAV vocabulary as a BSI Flex standard and make it available through an interactive website showing each term and its definition with clear version history. It covers a wide range of terms from "automated driving system" to "vehicle-to-infrastructure (V2I)".

Multiple iterations of the standard were created with input from an advisory group of industry experts and stakeholders, as well as through public consultation.

The vocabulary was developed as part of a wider CAV standards programme.

Outcome: Three versions, or iterations, of the vocabulary were created within less than a year. The first version of the vocabulary was created within a few months, with each subsequent version taking around 6-8 weeks. From the time that the first version of the vocabulary was published, it has remained available as a point of reference.

The iterative approach proved to be valuable, with new terms emerging and existing ones amended, or sometimes dropped based on stakeholder feedback. This has meant that the latest thinking on good practice is available as a resource for industry and it is helping to inform future standards development.

Source: BSI

6.1.2. Supporting communities of interest

An open and dynamic approach to stakeholder engagement is important to capture and evolve good practice in areas of fast-moving innovation. To support this, it is helpful to tap into communities of interest to discover and test good practice. In turn, agile standards can support the needs of these communities.

For example, digital twins are an area with strong potential in the built environment. There is some existing thinking from other sectors, including from high-value manufacturing and aerospace. Lots of built environment businesses are innovating and there is strong interest from large infrastructure organizations including water, energy and transport operators. However, there isn't yet an established view of what good looks like.

The DT Hub managed by the University of Cambridge, with funding from UKRI via Innovate UK, and with initial support from BSI, is addressing this need by connecting stakeholders across the supply chain to consider shared opportunities and challenges for digital twins. It has grown to over 1,500 members within a year of launch and provides a great mechanism to discover early-stage good practice that could be developed into agile standards.

Community-style approaches are also common in the digital space, for example platforms to share software code or to seek guidance on implementation. Tech associations and bodies have been applying some flexible, if not fully agile, techniques for years. These help to crowdsource industry thinking, facilitate open innovation or get feedback, to refine protocols and specifications. Prominent examples include the HTTP protocol for the worldwide web, driven by W3C, or the MQTT protocol for the internet of things.

Case study: World Wide Web Consortium (W3C)

Challenge: Common protocols are needed for the World Wide Web that promote its evolution, ensure its interoperability and help it to realize its full potential.

Approach: W3C uses Working Groups to develop technical reports in order to produce normative specifications or guidelines as standards for the Web. This follows an iterative approach where Working Drafts can be released before full consensus has been reached within the Working Group. These drafts are made available for review by the community (including W3C Members), the public, and other technical organizations. These drafts then progress through multiple stages, including Candidate Recommendation, Proposed Recommendation and W3C Recommendation (this last stage means it has been endorsed by W3C).

Outcome: W3C, building on the work of its founder Tim Berners-Lee who coined the term World Wide Web and created the first version of HTML, has developed a wide set of standards to support the evolution of the web as it extends into data, services, devices and trust. Together with its members and wider community, it is playing a central role in supporting digital transformation across the globe.

Source: W3C website

6.2. Rapid response to major shocks

Sometimes change is forced upon markets. External shocks can drive a need to rapidly reconsider what was previously seen as good practice. In this case, agile standardization approaches are an essential part of helping industry to adapt.

The responses to global and national crises with the COVID-19 pandemic and Grenfell are two important, current, examples that are driving significant change in the built environment.

In the case of COVID, this has impacted a whole raft of standards and guidelines, from those addressing the production of personal protective equipment (PPE) and ventilators, through to safe working in offices and other workplaces. For example:

- AFNOR, the French standards body, and BSI, have each used flexible, or agile, approaches to rapidly develop standards related to PPE

- BSI applied an agile approach to rapidly develop three iterations of guidelines for safe working during the COVID-19 pandemic, which are now due to become an international standard

- The UK government quickly developed a set of specifications for ventilators

Case study: safe working during the COVID-19 pandemic

Challenge: In 2020, the COVID-19 pandemic turned the world of work upside down, with everyone facing unprecedented challenges. Organizations needed to react quickly to protect the health of their employees and the public. As part of this, they needed to access up-to-date guidance on the health, safety and well-being of workers.

Approach: BSI worked with experts from many sectors and disciplines, with knowledge and experience ranging from HR, health and safety and facilities management, to accessibility and security. The Advisory Group rapidly developed good-practice guidance, applicable to all organizations and workers which complemented information from government, regulators and professional bodies. The Guidelines created a framework for safe working during the pandemic, to protect people from work-related risks from COVID-19. They included practical recommendations on how to identify and manage risks.

Outcome: BSI published its first Safe Working Guidelines BSI Flex standard in May 2020, and Versions 2 and 3 followed in July and August. The first version was produced in just two weeks and the subsequent iterations benefitted from comments received during public consultation. The Guidelines were then used as the basis of a new international standard, PD ISO/PAS 45005:2020, *Occupational health and safety management — General guidelines for safe working during the COVID-19 pandemic.* Developed in record time, in response to the urgency of the situation and the immediate need for information, by experts from over 30 countries, the international Guidelines published in December 2020. The document is free-to-access and has been widely used and downloaded over 20,000 times in the UK alone.

Source: BSI

6.3. Supporting regulatory flexibility

Voluntary standards have long played an important role in complementing regulations. Agile standards could add to this by providing flexibility in emerging spaces where there is a need to avoid being prescriptive:

- Sometimes standards are directly referenced by regulators and government

- Often standards are created to address gaps in regulations, or to provide an industry-led view of good approaches that can flesh out principles-based regulation

- Many regulators are keen to support innovation, and agile standards could provide greater flexibility to enable this to happen

- New products and approaches often cut across industry boundaries and don't neatly fit within the sphere of a single regulator. Flexible standards, where the scope can evolve over time, could help to bridge this gap and support new market entrants

This is an area that needs further exploration, but agile standards could play a valuable role in augmenting regulation in areas such as:

- Electric vehicles and the decarbonization of transport (as these span multiple domains including environment, energy storage and grid, built environment infrastructure, transport and manufacturing)

- Construction products and materials that contribute towards energy saving and carbon reduction

- Smart devices that are used for multiple, and diverse, purposes; and

- Complementing "regulatory sandbox" approaches that are used to support innovation, for example from regulators such as the FCA and Ofgem

Case study: Planning London Datahub

Challenge: To create a single set of data about development proposals in the planning system in London in a single format so that we can understand how the city is changing.

Inside the Greater London Authority (GLA) there are 35 planning authorities (excluding the GLA) with responsibilities for determining planning applications, all operating their own business processes, politically led, with different technical solutions as back office solutions and different technical capacity and capability and appetite for change. To achieve a single approach would not have been possible within a decade.

Notwithstanding the technical challenges, the biggest challenge was to define the right data to collect.

Approach: Working with planning authorities and interested parties, the GLA produced a single data standard for data to appear in the data hub. However, it was acknowledged that due to technical limitations, data would need to come initially through multiple channels including:

- Planning Authority Back Office Systems – for business process information, such as description, categorization, valid date, decision, etc. (where they are unable to receive and supply the full data set)

- Direct from the Application through online submission platforms – for data about the development proposals

- Other Sources – for related data, such as Community Infrastructure Levy (CIL) and commencement/completion data (still in progress)

Due to the wide-ranging remit and powers of the planning system, this data standard is iterative, and the first review is being considered for 2022, when the GLA will have a better understanding of what it doesn't know.

Outcome: A single live planning data set for London, showing all planning applications submitted since November 2020, with related data, such as floorspace, parking and infrastructure requirements.

The data was released in March 2021 and is updated daily. The full data set has already developed a wide range of users.

There are a number of iterative areas including:

1. The data standard itself, which will have a formal mechanism for change

2. The mechanism of receiving the data is flexible so the different systems can offer up the data in different formats, and

3. The system is built in elastic meaning that it can be amended to meet the GLAs future (as yet undefined) needs

Source: GLA

7. Conclusion

This paper has described how an agile approach to developing standards is needed to respond to rapid change, from digital transformation to the shocks provided by COVID-19 and other seismic events. The required agility combines speed and flexibility and works best where it is market driven – and not, say, just going faster for the sake of it.

Agile approaches are starting to be applied in multiple industries, including in the built environment, manufacturing, digital and beyond. This brings considerable benefits including accelerating the take-up of innovation, supporting increased resilience and complementing regulation. However, agile standards won't always be appropriate and sometimes a more traditional approach to standardization will still be the right choice.

The best starting point, as ever, is to really understand the market need. In each case, assess whether good practice is stable or emerging, and if it is expected to evolve soon, as well as considering what will be the benefits and drawbacks of an iterative approach. It is also important to learn from the experience of others who have already started to apply agile standards.

An agile approach to developing standards will allow many more organizations to contribute to and tap into good practice, realize the benefits much earlier in innovation cycles, and support a dynamic and resilient recovery for the built environment and beyond.

We would welcome your ideas on areas where agile standards may be valuable. To discuss this with an expert please contact us here.

About BSI

BSI is the business improvement and standards company that enables organizations to turn standards of best practice into habits of excellence, 'inspiring trust for a more resilient world'. For over a century BSI has driven best practice in organizations around the world. Working with over 77,500 clients across 195 countries, it is a truly global business with skills and experience across all sectors including automotive, aerospace, built environment, food and retail and healthcare. Through its expertise in Standards and Knowledge, Assurance Services, Regulatory Services and Consulting Services, BSI helps clients to improve their performance, grow sustainably, manage risk and ultimately become more resilient.

To learn more, please visit: www.bsigroup.com

About the National Digital Twin Programme

The National Digital Twin programme (NDTp), hosted by the University of Cambridge, is playing a key role in the digital transformation of the UK's Infrastructure and built environment. Launched by HM Treasury in July 2018, the NDTp has a mandate from Government to facilitate the development of a National Digital Twin – an ecosystem of connected digital twins - to foster better outcomes from our built environment. This is enabled by the Information Management Framework (IMF) and a socio-technical change programme which together provide the necessary building blocks for connected digital twins to share high quality data securely and effectively. The NDTp is uniting the collective knowledge of diverse voices of experts to support and empower others to advance change and embrace connected digital twins within their own organisations.

About the Construction Innovation Hub

The Construction Innovation Hub's vision is a world where our built environment improves quality of life, delivers greater social value, reduces environmental impact and is delivered by a world-leading, innovative and sustainable industry. We are pioneering ways in which buildings and infrastructure are procured, designed, delivered and operated to deliver market-ready products and processes that will shape our future built environment, ensuring safety, quality and value. We are guiding a collaborative programme, using world-leading processes and technologies, to create a market with the capability and capacity needed to deliver the UK's construction and infrastructure needs. This collective innovation will drive adoption of manufacturing-led approaches to construction, digital tools and secure, connected data that support sector growth and open export opportunities, accelerating recovery and the transformation to a future-ready sector.

The Hub is funded by UK Research and Innovation through the Industrial Strategy Challenge Fund.

Get in touch

To explore how good practice can help you become more resilient, transform and grow get in touch with one of our team.

Contact us