



TAPPI2: Review of Application Guidance and Standards for Technology Enabled Care



The voice of technology
enabled care

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Background

The TAPPI project (Technology for our Ageing Population: Panel for Innovation) has been working to test and optimise the ‘principles’ established by the TAPPI programme. This led to a broader question of how to get an optimised set of TAPPI Principles embedded in the broader housing development and care systems, given the wide range of stakeholders with differing strategic objectives. The TAPPI work would not be of value if the principles and framework were not included in everyday conversations about how to help people lead the lives they want, enabled by supportive services and technology applications.

The second phase of TAPPI employed six parallel implementation projects, and it has included workshops with residents and with housing and service providers to try to identify best practice, and how this can be embedded more widely, perhaps through standards development, guidance and training.



The original TAPPI Principles

In the following sections we provide a summary of the workshop findings along with guidelines and recommendations for embedding TAPPI principles, with the updated TAPPI principles found at the end of this document:

1. Obstacles to Personalisation

The TAPPI2 workshops highlighted issues relating to personalisation, and we will see that these cut across multiple original TAPPI principles, including ‘person-centred’, ‘co-produced’, ‘choice-led’ and ‘interoperable’. Personalisation is perhaps easier to describe than it is to achieve. We want to make sure that each of us can benefit from the services and technologies that suit our individual lifestyles or needs. However, suppliers of services and technologies often try to create something that can be delivered economically at large scale. This is understandable, as scale usually delivers lower-cost, and if done well and repeatedly it can also result in higher quality. Where something is individualised, perhaps to the point of uniqueness, we are usually asked to pay extra for it, and it may come with the risk of lower levels of ongoing support and maintenance.

Perhaps we should trace this thinking back to Henry Ford in the 1920’s, making huge numbers of the same car model, in the same colour, using nut and bolts and many other parts that came in standard shapes and sizes. Mr. Ford had plenty to say about standards, including:

“Standardization means nothing unless it means standardizing upward.”

In other words, let’s aim for continuous improvement, just as we seek new and better standards in TAPPI to help improve the way we lead our lives.

These issues were highlighted in our TAPPI2 workshops. Consider the situation where housing providers are pursuing living environments and assistive technologies that work for many different tenants with a wide range of changing needs. The housing providers also need to control costs, perhaps by installing a common technology infrastructure for alarm calls, but then face the challenge of whether the common elements will align with different people’s needs; one person may benefit from technology which detects night-time falls when venturing to the bathroom, but another may just want to make video calls with their grandchildren. The list of personalised needs leads to a long list of technology options, and where the best products in each case often come from different suppliers. Despite these complications, it is evident that tenants seek:

- technologies that are seamlessly joined-up
- technologies that are easy to use
- coordination of the services that use the various technologies
- integration of other solutions, such as new pharmacy services or organisations offering supportive care services.
- incorporation of open consumer technologies to give people the technology they want (e.g. how to link a smart-speaker to an alarm system?)

Those areas in need of standardisation support or further guidance were identified as follows:

- a. **Reconciliation of scale and replication with personalisation:** Standards should consider how to specify the core, or infrastructural elements of a living

environment (particularly in relation to technology-enablement) whilst catering for individual solutions. This probably requires technologies for housing and care to move to modern concepts of 'platforms' that enable personalisation through 'apps', much as we see with mobiles, tablets, TVs, PCs.

- b. Best practice methods for co-production:** Guidance needs to address whether the TAPPI2 choice-led approach could become the norm and mainstream, and whether co-production can result from democratic decision-making that selects a common core platform. These methods also need to support family involvement/consultation.
- c. Personalisation demands interoperability of technologies:** The priority is to enable choices of technology solutions that suit each resident whilst enabling coordinated support services. One of the solutions to this challenge is to require that the technologies work seamlessly together; products from different suppliers need to 'interoperate' and share information in a secure way.
- d. Incorporation of 'consumer' technologies in TEC systems:** Meeting tenants personalised needs for a seamless technology experience, by incorporating their preferred or familiar technologies. We would then need to address challenges to standards relating to safety and reliability that may be cited for use of consumer technologies.
- e. Assuring quality in a personalised service offer:** How to make sure that support services meet expectations despite the complications of multiple, connected services and technologies from differing suppliers?
- f. Procurement frameworks to support these principles:** How to restrict procurement to open, interoperable and easy to use technologies, and to coordinated service delivery?
- g. Housing Design Standards:** It was commented that 'Lifetime homes' standards are in use and standardised in Wales, but what of the rest of the UK? It was also noted that the Housing our Ageing Population: Panel for Innovation (HAPPI) 10 principles includes one which makes reference to new and emerging technologies, such as telecare.

2. Digitisation and Resilience

How can we make sure that we all get good ‘digital connectivity’ for our personal devices, in and around our homes. Traditional phone lines are scheduled to disappear in the UK from 2025, to be replaced by ‘digital only’ connections to our homes, and in many cases it has already happened. We may even be asking the question: How can I be sure of making a phone call in an emergency when power failure stops my digital connection from working?

The quality of the digital connection to the home is therefore a good start point for standardisation – does it provide enough data when we need it, and does it work reliably? However, many of our housing developments and community buildings also include ‘communal areas’, where we can meet friends for lunch, games or perhaps explore what is blossoming in the garden. This raises the question of whether our personal devices, such as mobiles and tablets, will be able to move easily between these spaces and still connect seamlessly. Then, who is responsible for providing communal WiFi, is the coverage good enough and how easy it is to log-on to different networks?

We also need to remember that many of the modern technologies, including digital alarm systems, actually connect over ‘mobile networks’. So, we also need to know that the mobile network coverage is adequate inside our homes, and that it works more widely for when we want to explore the local community whilst still being connected and protected.

Feedback from service providers indicates that ‘analogue to digital switchover’ is still a significant risk to the TEC sector. For example, digital mobile products are central to many plans for the replacement of analogue products, and several recent failures of mobile networks have impacted our confidence in digital reliability.

Areas for potential standardisation support or further guidance were identified as follows:

- a. **Digital access rights:** Digital access ‘should be viewed as a service that we all have rights to, like water and power’. Lack of digital connectivity amounts to exclusion. However not everyone has access. How can we standardise as part of a housing offer?
- b. **Network access and coverage:** Some rural (and city) locations pose geographic challenges to network coverage, for both fixed-line broadband and fibre connections or mobile 4G/5G connectivity. This poses problems for analogue to digital migration of TEC. Do standards and guidance for installation assessment need to change?
- c. **WiFi useability:** Wifi-internet connectivity is variable in grouped housing and care home environments, in both individual apartments and communal areas. Therefore, access to WiFi is sometimes seen as not equitable. Signal strength and data rates can vary greatly, dependent upon the WiFi infrastructure that

has been deployed. Methods of access and password control also vary. Some providers see commercial and legal problems in providing communal WiFi (e.g. does a housing provider become a communications provider?). Standards and guidance for WiFi use should be considered.

- d. Digital product quality:** Several TAPPI2 service providers have encountered problems when procuring digital TEC products. Here, products are promoted by suppliers, but they are sometimes 'not ready' (reliable) or not fully digital in many cases. Products for grouped housing systems are described as a particular challenge, as they appear to lag behind the rest of the market ("housing is not prepared for digital switch and neither are the products and suppliers"). Where national or regional standards exist (e.g. Scotland) they can understandably restrict product supply, which impacts on competitive procurement. Could some form of product assurance or 'kitemark' scheme be embedded in standards?
- e. Installation services:** Delays and installation problems have been encountered with telecoms suppliers. The quality of installation work is sometimes an issue. How is this 3rd party service to be quality assured?
- f. Monitoring Centre Options and Resilience Standards:** Providers of TEC monitoring services would appreciate guidance on the best options for providing resilient services as we switch to digital solutions, and where traditional ARC installation methods may not apply. The following sample questions are indicative of the guidance or standards needed:
- Should we use 'cloud' or 'hosted' or 'on-premises' installation?
 - Do we need to retain on-premises IT solutions whilst analogue connections are still being used?
 - Can we provide our own Software as a Service (SaaS) platform?
 - How best to handle business continuity across the digital systems?
 - In terms of data protection and security, the position on encryption needs to be clearer.
 - How to create and manage shared ARC concepts (across multiple services)?
 - How to engage with shared ARC infrastructure where they are constructed around Local Authority shared access only?
 - Should we use separate ARC platforms for analogue and digital?

More guidance and support on these questions and options should be provided.

- g. Housing Infrastructure:** New build housing is perhaps relatively easy when it comes to specifying digital TEC infrastructure, but what standards could/should be applied to the refurbishment or upgrading of older properties, arguably the majority of the UK's housing stock. Guidance and standards on each type of housing property TEC infrastructure would help; in particular specialist housing for older and vulnerable people.

3. Roles, Responsibilities and Governance

Housing and service providers raised a number of concerns where improved guidance and standards could help to clarify the situation.

- a. **TEC equipment ownership:** Where should the commitment and costs sit for TEC (and technology more widely)? It was expressed that it should not necessarily reside with the housing provider, since care needs assessment responsibility sits elsewhere. The situation is viewed as particularly difficult for social housing, where costs and charging are regularly questioned.
- b. **Care responsibilities:** Providers need clarity on care responsibilities. Are there standards relating to who owns the role and the process of making individual assessments of need in a housing setting, and then recommending/supplying solutions?
- c. **Family engagement:** Coproduction guidance needs to support family involvement and consultation. Some personalised solutions may require additional funding, and where family-pay or co-pay is an option beyond self-funding a TEC solution.
- d. **Costs and Prioritisation:** Cost is a major issue. If regeneration, repairs or improvements of an older housing scheme are needed, people may choose new windows before TEC. Can any capital funding be ring-fenced, or another solution adopted to ensure consideration of TEC?
- e. **Cross-funding:** There are cross-funding problems, in terms of what certain housing, social or health care budgets can pay for. Perceived conflicts can arise when trying to support multiple people with different needs or commissioning the appropriate services. Guidance could help.

Trusted advice: How should housing work with care service providers? By signposting tenants to providers perhaps, but how can the quality of service providers be assured? Is there access to trusted and independent advice and information?

4. Managing Digital and Data Risks

Increasingly, we rely on digitised services and technology in our daily lives, including entertainment, phone messaging, on-line shopping, bank access, through to the management of healthcare appointments, or even measuring our state of health. It would be infuriating if we needed to set-up and personalise our access to these services each and every time that we use them. So, we make a deal with the technology and service providers – we trust some of our personal data to them, to make our use of the services easier, and in return we hope that the providers will not abuse our trust. This implies that some very big companies, often not based in the UK, are using complex technologies (and maybe artificial intelligence) to store and process our data, and they are perhaps using the information in ways that we have not yet dreamed of. Hopefully all of this aligns with our consent for use. So, in this environment, can we ensure that our data is protected and used only in the ways intended, and that it is safe from hackers? This may require that any personally identifiable information only goes to the trusted service providers that we choose, and that all other data is in some sense ‘anonymised’. The risks associated with digital upgrade are perceived as ‘still very real’ by TAPPI2 providers, and a number of areas were highlighted as follows:

- a. **Loss of Digital Benefits:** Whilst TAPPI2’s intent is to look at more progressive, proactive and personalised technology, the challenges of keeping users safe and secure as they move to digital is taking priority. Some housing providers are therefore treating ‘proactive’ and ‘digital’ as different parallel initiatives, which would negate one of the major benefits of digitisation. Guidance (or models) on how to manage the balance of risks would be appreciated.
- b. **Data Protection:** There are risks associated with the protection of data, where it is stored, how it is processed and who has access. For example, can standards ensure that data only goes to the consented service provider and/or user, and not to a big offshore technology supplier? In short, are there adequate standards to ensure that interfaces with the various digital organisations align with our wishes?
- c. **Data Access and Consent:** The needs for and access to data should be informed by roles and responsibilities. Data should not be shared without resident consent. This consent should be captured during resident induction and sign-up to services.
- d. **Data management:** This is an area needing more support. Is there a system design approach that addresses the data risks and which should be mandated for suppliers?
- e. **Policing the standards:** Even with ‘compliant’ suppliers, ‘there are examples of security shortfalls’. How is TEC security standardised and who polices product suppliers?

5. Awareness, Skills and Ease of Use

Technology Enabled Care comes in many forms, and functions and features vary between suppliers. This has created challenges for the TEC sector in raising awareness and understanding of technology options across housing and care, and work is underway elsewhere on these issues.

Multiple products and technologies emerge from our pursuit of personalisation and choice. Furthermore, when a new product appears in our homes, we want to know that it has been installed well, that it works correctly, but we also need to understand how to use it, without being bamboozled by too much technical detail, and importantly we need to know that it will keep on working. Then, how do we get help when something stops working?

Our housing and service providers worry that lots of different technologies, from different suppliers, create problems in terms of lack of familiarity or training needs for residents and support staff. This can also mean that many maintenance contracts are needed, as suppliers may not be qualified to service and fix different products.

The comments that follow relate to digital TEC issues that were raised during TAPPI2 interviews:

- a. **Digital awareness of users:** This is a big issue for many residents, where interest in the technology may be limited and where resident feedback often describes the technology as 'too complicated'. Can standards help by promoting the design of products that are easier to install and more intuitive to use, and for easy to understand descriptions of TEC functionality?
- b. **Digital readiness of housing providers:** Staff digital awareness and readiness are still concerns for housing providers. Guidance and training are continually needed.
- c. **Signposting:** Residents need help to navigate the digital world, such as:
 - simplified service contracts for broadband, with clear costs
 - easy access to security checks to protect against fraud
 - training on technologies
 - how to get help when something stops working
- d. **Engineer skills:** Can standards be applied to the skills and certification of installers and maintenance providers to ensure that multiple supplier technologies can be managed?

6. Service Management Challenges

The TAPPI2 delivery sites identified two areas of service challenge that could not be immediately related to existing work on service standards:

- a. **Maintenance:** There are multiple technologies in use at each site, from different suppliers. The suppliers currently have limited knowledge or face commercial constraints that affect their ability to maintain or repair each other's products. This creates the complexity of multiple maintenance contracts. Can a common approach be defined?
- b. **Mobile alarm tracking and response:** Where people have no friends or family willing to respond then we need standards or guidance on the type of service and assurances that can be offered when a mobile alarm is alerted.

7. Evaluation and Evidence

The TAPPI2 delivery project workshops included much discussion of the evaluation of services and technologies, and how evidence could or should be captured.

There was universal agreement on the need to demonstrate beneficial outcomes in terms of both the wellbeing of the resident/service-user and the economic benefits to commissioners and providers. This evidence is seen as vital to justifying investment. Currently the evaluations are piecemeal, often based on small pilots. The challenges identified here are:

- a. **how to address evaluation in a consistent and compelling way for TEC?**
- b. **Can evaluation itself be standardised?**
- c. **How should the resulting data be managed?**

8. Recommendations & the new TAPPI Principles

a) **Digital connectivity needs to be recognised as a core service**, and people should have access that parallels that for water and power. The development standards for new homes and Decent Homes Standards for existing stock, and procurement specifications need to address:

- Digital access rights
- Network coverage and minimum performance requirements
- WiFi access and performance in communal spaces
- Connectivity options for both new build and refurbishment of older housing

The Older Persons Housing Taskforce should consider the need for a 'digital connectivity' social tariff for supported housing.

b) **A new 'architecture' for TEC is needed**, and it should be driven forward by Providers and Commissioners of care, using a revised set of guidance, standards and procurement frameworks. This architecture needs to enable personalised solutions and choice, whilst offering care providers a single view of a person. These same principles should be incorporated in new build and Decent Homes Standards. This all requires action on several fronts:

- Different care technologies should work together (open interoperability)
- A common model for use, sharing and protection of data
- Incorporation of familiar and consumer-led devices
- A review of quality assurance processes for personalised and integrated services

c) **The resilience and maturity of digital TEC solutions needs to be assured** and communicated to users, care providers and commissioners. This requires further development of service and technology standards by care regulators and TSA. These need to consider:

- An easily recognised assurance framework ('kitemark') for end-to-end quality of products and services
- Revised models for 'business continuity' of TEC services, that reflect the underlying reliability and coverage of digital communications
- New options for deployment of technologies in the home, in communal settings and in monitoring centres
- Installation service quality
- Data management: access, sharing, consent and protection
- How the related standards are policed

d) **Governance processes and key roles and responsibilities need to be reviewed**, so that:

- Responsibilities for care assessment and recommendations for use of supportive services and technologies are clearly defined across care, health and housing professionals

- Service users and family members are actively engaged in co-production of personalised TEC solutions
- Budgetary ownership, TEC budget allocation and eligibility criteria are clearly defined

e) **Continue to build the awareness and perceived value of technology-enabled support and care** amongst potential users. This will require greater efforts from the TEC sector, and includes:

- Customers of housing and TEC services having access to trusted and independent advice and signposting to the options available to them
- Greater awareness of digital TEC options and infrastructure amongst architects, builders and housing service providers
- Adoption of a common and user-friendly language for the different types of TEC
- Initiatives that promote and recognise good product design, to target ease of use and incorporation of familiar user interface technologies
- Capture of clear descriptions of the costs and benefits of using TEC, based on a growing body of peer-reviewed evidence

f) **Pursue service quality improvements**, to support TEC service delivery. These initiatives would include:

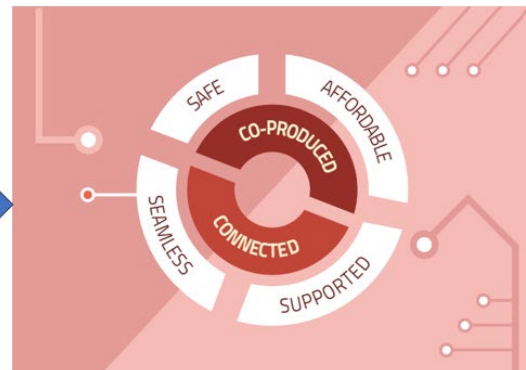
- Clear processes and role allocation in response to new and proactive information presented by digital TEC systems. TSA should consider impact on service quality standards
- Service models for mobile alarm monitoring need to be reviewed, to ensure people's expectations for service response are met
- Establishing common standards for the skills and certification of installers and maintenance providers to ensure that service providers can manage multiple supplier technologies safely and cost-effectively

g) **Standardise evaluation of TEC**, and move away from small 'pilots', which needs:

- A definition of how best to evaluate TEC in a consistent and understandable way
- Standardisation of how evaluation data is gathered, aggregated and analysed, and then made available to commissioners and customers.

h) **TAPPI principles should be reviewed and improved** to reflect the feedback gained through the TAPPI2 work programme, and then embedded in future procurement processes.

In line with the recommendation above and the wider feedback from across the programme, the original principles have been reviewed, amended and we hope to see organisations putting them to use across all activities:



The updated TAPPI Principles