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2. EXECUTIVE SUMMARY

The [2021/2022 Plan](#) from Digital Health and Care Wales (DHCW) summarises the vision and future steps that DHCW has to undertake to accomplish that vision (Digital Health and Care Wales, 2021). DHCW has become a Special Health Authority (SHA) on the 1st of April of 2021, following the aims of Welsh Government (WG) of improving digital access by delivering a digital transformation through the provision of the digital technology and the data services required for healthcare in Wales.

This Plan, even though it is a public document, is more internally oriented which is why in the analysis provided in this report using tools to evaluate digital strategies, there are areas in which it shows weaknesses as its purpose is different to that of a digital strategy. It is worth noting that DHCW, being a new organisation, has opted to wait for the WG digital strategy to be published to write its own.

In this document, the current state of technology delivered at a national level – that DHCW is in charge of – is outlined, and an analysis of the Plan is conducted according to the salient points of three frameworks: Healthcare Information and Management Systems Society (HIMSS), PESTLE and NHS Providers. These three have been chosen because they complement each other. The HIMSS framework is used the basis of the analysis as it is comprehensive, the PESTLE framework is incorporated to focus on external factors, and the NHS Providers guidance to incorporate a more digital view.

As the focus is on the deliverables, the Plan effectively describes the intention on how the programmes will provide the information systems (IS) to be used or implemented in Health and Care settings. Overall, from a HIMSS perspective, the Plan is from neutral to good in all aspects, with no major drawbacks. However, there are gap areas and conflicting priorities which are not addressed. At the same time, given its nature, the Plan rarely makes reference to external factors which is why the rating is poor for the PESTLE framework.

From and NHS providers perspective, the strongest points of the Plan are its focus on digital and the integral role it has in the delivery of a digital transformation. Yet, in accordance with the analysis done with HIMSS framework, the workforce and target audience/user-centred approach come out as low points. The strategy looks at ‘professional empowerment’ as part of its vision, not as how to improve professional’s digital dexterity but rather by providing data for better clinical judgement. The same can be said for ‘patient empowerment’.

All in all, rather than providing an overarching framework or describing an implementation theory, the Plan focuses on how each programme is projected to be carried out at a high-level. It shows it is a



lechyd a Gofal
Digidol Cymru
Digital Health and Care Wales

Digital Health and Care Wales | STRATEGY ON A PAGE

Our Vision....	Our Ambition....	Our Partners....	Our Routemap....
Delivering information and technology for better care We will deliver to the people of Wales first-class digital health and care services which will enable more effective, efficient, safer decision-making by providing access to content-rich, person-focused health and care data and information.	We will: • mobilise digital transformation by building on our foundations of data protection, infrastructure and information availability and flow - opening up our architecture to enable faster, consistent sharing of data with partners and suppliers • support the modernisation of clinical specialities and healthcare processes through delivering dedicated high quality digital services • empower staff and patients by combining data from many systems to form a comprehensive digital health and care record accessible anywhere, when needed, via easy to navigate digital entry points • enable users to derive value from data collected from national and local systems through Big Data Analysis	By working at the start with patients and the public, and national and local partners we can understand the future direction of healthcare and how we can play our part in patient centric care. We will help enable that transformation and change through data and technology solutions.	Year 1 • Establish the new Special Health Authority • Consolidation of enablers • Continue to support the pandemic response and recovery Year 2-3 • Open and interoperable • Cloud First Year 4+ Significant value from data

Development of the New Digital Organisation

OUR OUTPUTS AND OUTCOMES....



Big data analysis..... FOR BETTER OUTCOMES AND VALUE BASED CARE

Expanding the content, availability and functionality of the digital health and care record.... SO THAT CARE AND TREATMENT QUALITY IS IMPROVED

Delivering high quality digital services.... TO SUPPORT EFFICIENCIES AND IMPROVEMENTS IN CARE PROCESSES

Mobilising Digital Transformation.... SUPPORTING JOINED UP CONSISTENT CARE

Digital Healthcare Professional Empowerment

Digital Patient Empowerment

Public Health

Primary and Community

Planned and Unscheduled Care

Medicines Management

Diagnostics

Sustainable Infrastructure

Protecting Patient Data

Information Availability and Flow

3. BUSINESS DRIVERS

DHCW's governance structure is defined and available for public access in the document named *Governance Assurance Framework*; in it, the operating model for governance and decision-making process are also described (Tolley, 2023). Figure 2 depicts DHCW's high-level structure. One of the identified difficulties that DHCW has had from a governance perspective, was the difficulty in hiring

for strategic posts like the Executive Director of Strategy which has led to delays, and other executives taking ownership of responsibilities that were not related to their post, until these crucial posts were fulfilled, as identified by the Wales Audit Office (2023).

As an organisation that has mutated from being under the management of a trust (Velindre NHS Trust) to become a separate entity with its own authorities, DHCW has undergone impressive changes while keeping the core of its staff. People are an organisation's greatest asset, and DHCW demonstrated that in an impactful change as this, it had a great retention capacity. It had 969 employees in 2022 which has increased since. However, after starting operations as a SHA the rate of turnover is slightly over the desired, at a level of 8.35% in August 2022 where the target was of 7.5% (Wales Audit Office, 2023). Trends of this figure will be required to further analyse the need for strategy on retention of highly specialised staff which are not abundant.

Becoming independent and growing in size and scope brings about multiple challenges. The onboarding of new staff requires that communications are strengthened. Yet, one of the most difficult tasks is redesigning the way of working by braking silos and aiming to achieve an all-Wales, interoperable systems approach to delivering IS. The fact that the organisation was created during the COVID-19 pandemic made the transition even more challenging, as it was incorporating staff to cover new posts, only after recently changing its usual way of working to fully remote, meaning that training also needed to adapt to the situation, and team building becomes more difficult as interactions are not fostered naturally between members.

As an organisation DHCW needs to demonstrate that it is up to the challenge of standing on its own as a SHA and that it can become a trusted partner. The relationship with the organisations it serves needs to change, which implies an ability to take more voices into consideration, including challenging ones, accepting the feedback, and learning from it. Bias, and falling into old routines already ingrained in the mindset of employees, can lead to these ties being weak.

DHCW has the opportunity to demonstrate the wish to connect, deliver central repositories to share relevant information, and be at the heart of digital transformation helping organisations to embrace the change, while providing single-instance national solutions, as opposed to the current versions which are too tailored locally making them difficult to maintain and slowing down releases of newer features.

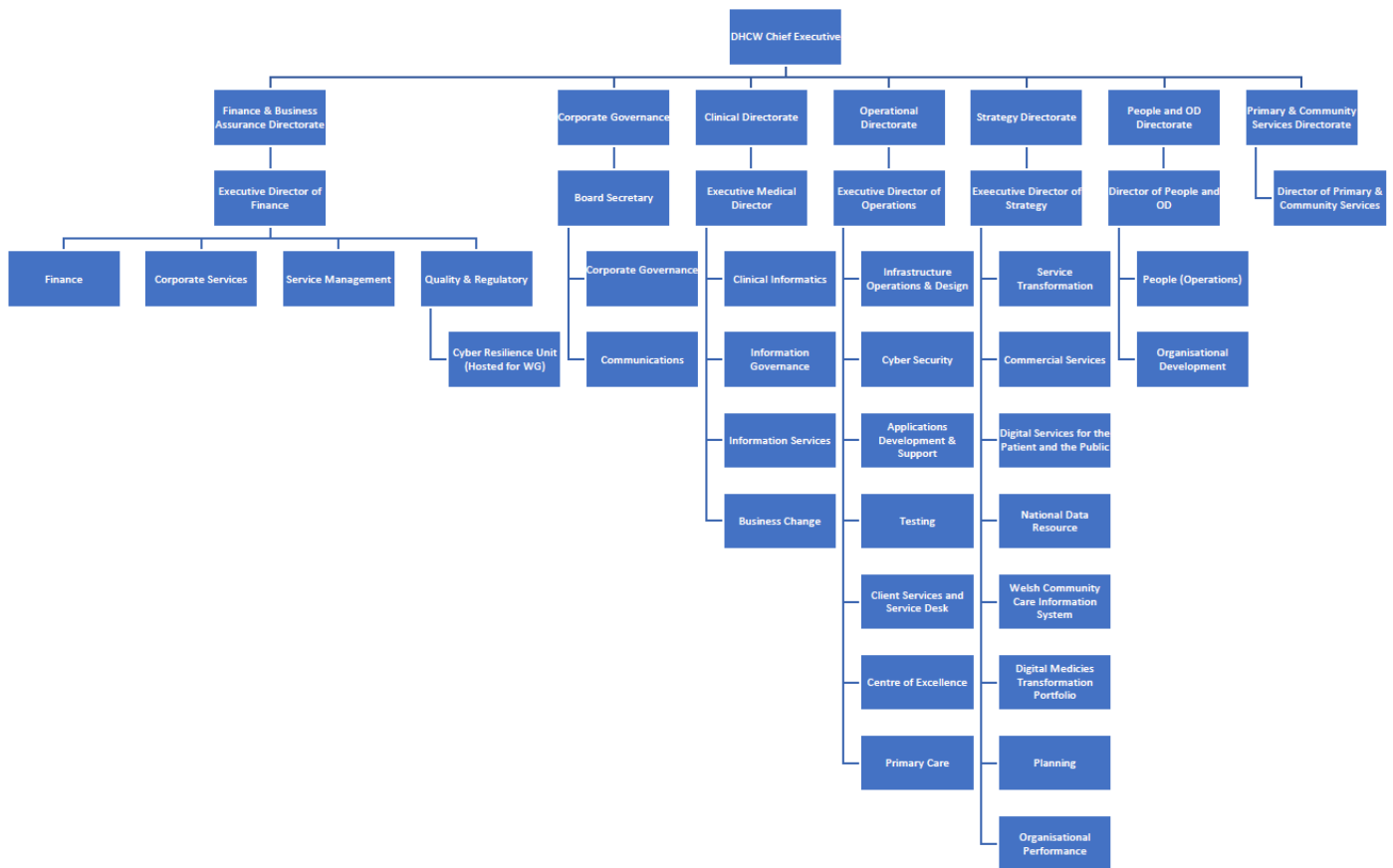


Figure 2: DHCW High-level structure (Digital Health and Care Wales, 2022b).

4. TECHNOLOGY AND DIGITAL TRANSFORMATION

DHCW delivers technology and aids in the digital transformation of other organisations within Wales, from HBs, to local authorities, and WG. In order to improve, DHCW has commissioned a digital maturity evaluation for all of Wales to understand the challenges that arise in trying to deliver a digital transformation.

4.1. Core operational systems

DHCW manages an array of systems which include in-house developments and off-the-shelf products. For the latter ones, DHCW manages the contract at a National level allowing for a more competitive tender as well as ensuring that high standards are in place. Currently, over 100 systems are under the responsibility of DHCW.

DHCW's flagship system is the Welsh Clinical Portal (WCP) which was first released in 2011. This system is the 'window' into the patient's clinical record. Nowadays, the Welsh Nursing Care Record (WNCR) which is the portal view for nursing assessments, has seen steady growth and is enjoying a

good press. Other portals managed by the organisation are the ones used by GPs. Even though these are 'purchased' by the GPs as independent contractors, they can only choose from two systems that comply with the desired characteristics, and their national contract is managed by DHCW. Another example is the Welsh Community Care Information System (WCCIS), which is the window to the record in the community setting, aimed at integrating health and social care.

Communications between primary and secondary care are achieved via two main routes: 1) for GPs, referrals are sent via the Welsh Clinical Communications Gateway System (WCCG), processed via the Welsh Patient Referral System (WPRS) and booked via the Welsh Admin Portal (WAP), with information/replies flowing back via WCCG, and discharge advice letters (DALs) are also sent via WCCG; 2) for dentists, the Dental Referrals Management System (DRMS) covers part of the process of sending referrals from dental practices.

The Welsh Laboratory Management Information System (WLIMS) and the Radiology Information System (RadIS) are in charge of laboratory and image results respectively, both procured and currently their contracts being revised/out for tender. Where WLIMS is a unique national system, RadIS operates in local instances to accommodate for variability.

As well, DHCW hosts central repositories of information. The Care Data Repository (CDR) provides access to the complete patient care record which is comprised of data from different sources: the Welsh Care Records Service (WCRS) stores documents, the Welsh Results and Reports Service (WRRS) stores results, and the Clinical Data Engine (CDE) is the storage for structured data. As well, the National Data Resource (NDR) aims to be strategic in bringing together all the patient data and information coming from health and social care across Wales (Digital Health and Care Wales, 2023b).

New deliverables include the NHS Wales App and the Medicines Transformation Portfolio, mentioned in the Plan, as well as the replacement of the legacy system used in Velindre for cancer patients, called Canisc.

4.2. Infrastructure

DHCW recognises the need for improving the existing infrastructure, as it has become inefficient. One of the key points is a legacy data centre (DC) which is based on unsupported infrastructure, which is why there is an intention to move away from it into a newer, more environmentally friendly DC mentioned in the Plan. Moving into a Cloud-based storage is also mentioned.

This poses a risk as the reliability of the service provider can be affected during the transition period which is also acknowledged. DHCW works with two simultaneous DCs, one of which is active and the other acts as a failover in case of failure of the first one; this reduces the chances of complete system

failure. The two DC are also geographically separate in order to avoid local issues (including weather conditions) affecting service provision.

The use of outdated resources and ‘technical debt’, also impacts on the security of the systems and service delivery, making it more failure-prone, slower response time and impeding upgrades. This task needs to be undertaken even if it temporarily halts innovation to prevent a bigger gap from forming.

4.3. Interoperability

The digital ecosystem across Wales is varied and service provision is specialty-oriented, hence interoperability is harder to achieve. The challenge for DHCW is to provide the basis for national interoperability to allow for safe data sharing, maintaining semantic coherence and data integrity as well as data persistence.

Currently, interoperability is limited to system-to-system processes rather than to central repositories containing the patient record. DHCW’s intention is to provide the standards which will become the framework for interoperability. Via provision of an open-platform approach associated with ‘messaging’ specifications like FHIR-standards, and open Application programming interface (API) management subject to appropriate safeguards and governance, the aim is to facilitate the access to information between the systems and the central repositories of information (Williams & Williams, 2022).

4.4. Information standards

The Data Standards Team in DHCW are responsible for maintaining and updating the NHS Wales Data Dictionary, which is a public collection of nationally agreed standards for data which are assured by the Welsh Information Standards Board (WISB) which is a body formed by representatives of the HBs, trusts and DHCW to ensure that the standards align with current practice across the nation. New standards are presented in Data Standards Change Notices (DSCNs) and Data Dictionary Change Notices (DDCNs) (Welsh Government, 2023).

As well, the Welsh Reference Terminology Service (WRTS) provides the coding system (SNOMED CT and FHIR compliant) to national systems, with UK/Welsh codes aiding in reporting and data sharing. This allows data to be used more efficiently for patient care and research (Digital Health and Care Wales, 2023a).

National systems need to adhere to these standards and any new standards that may be published, which is an essential aspect to achieve interoperability, supporting the delivery of value-based

healthcare. However, there is a clear gap in the existing standards and a need to establish new ones for those areas which have not been addressed yet.

4.5. Data analytics capabilities.

Health care is a massive producer of data. To harness the value of data and provide information that is useful to clinicians, Public Health Wales (PHW) and research, DHCW offers an array of services and platforms like the dashboards produced by the Value-based healthcare team.

In order to provide these services, it is imperative that data is structured and coded for it to be accessible to be analysed in a simpler manner. The NDR team, hosted by DHCW, intends to satisfy this need, and deliver the requirements to collect value of the data held by DHCW in the central repositories by providing a more joined-up access to these.

5. STRATEGIC ANALYSIS

To begin with, it must be stated that the document that is being analysed is not DHCW's digital strategy and this is because the organisation, being a newly established organisation by the WG has been waiting for WG to publish its own digital strategy (now released) before creating their own. Currently DHCW's digital strategy is under revision by WG and not available to view before it is published. Hence, the analysis is being made on the initial DHCW Plan which aligns to the structure of a digital strategy but is more detailed. This makes the below analysis very critical of the Plan as the aim of the document is different and thus it is built with another mindset.

The Plan will be examined using the key features present in the analysis done by the HIMSS framework, the PESTLE framework and the NHS provider guidance.

The HIMSS Digital Health Indicator (DHI) evaluates the organisation's growth and advances to create a functional ecosystem of IT solutions, and is used in this report. As well, the HIMSS framework has a model that is used to assess an organization's level of health information technology (HIT) adoption and maturity, with an organisation classified into one of eight categories according to the degree of implementation and integration of HIT, which could be later used by the organisations adopting DHCW's HIT (Healthcare Information and Management Systems Society, Inc., 2023).

On the other hand, the PESTLE framework is centred in how external factors affect the design of a strategy and if it is realistic to implement in a given context (PESTLE Analysis, 2023). In a complementary manner, the NHS providers guidance is oriented to the technological aspect and how

technology is used (NHS Providers, 2021). The combination of the three strategies can report a more holistic view on the strategy.

The aim is not to analyse the maturity of DHCW, but to assess if the Plan establishes the necessary steps to build an appropriate digital strategy. A comprehensive strategy describes an effective plan to help the organisation achieve their business objectives to be more digitally mature.

The strategy would need to include key elements mentioned by the HIMSS DHI (that would then be analysed by the Maturity Framework) which are summarised in Table 1. The first element is the driving policy, which in this case is mentioned in the *Introduction* section. Several documents produced by the WG have addressed the need for improvement of the digital solutions in use across Wales (Welsh Government, 2015) (Welsh Government, 2017) (Welsh Government, 2021b).

The Plan has a *Strategy on a page* that can be seen in Figure 1, which summarises it. The next two slides describe a number of 'Strategic objectives' which are divided into 'National' and 'Organisational' with a more detailed description of each of them. Throughout the rest of the Plan, these objectives are aligned and described in relation to the different portfolios that DHCW is delivering. However, these objectives can become confusing as the strategy is read. The level of detail present in the description of the portfolios and the location of the objective in each slide, do not make the reader instantly relate the two.

Understanding the target audience is a critical aspect. In this case, the document is available to the public, only accessible from within DHCW's website. Yet, it is not readily engaging for the public as it is very detailed. The content of the strategy is organised in a coherent manner, with distinguishable sections, and the communication is transparent, allowing the reader to get a thorough view of the future plans. For an effective strategy, the fact that the programmes are mentioned is according, but these have wordy descriptions which does not make it amicable for reading.

One of the main challenges that DHCW faces is the fact that it is attempting to deliver an ambitious portfolio of services and systems, and at the same time achieving this as an organisation that does not provide direct patient care which implies that it depends on subject matter experts from other organisations collaborating with DHCW to be able to deliver useful products. So, DHCW has a strong dependency on external support and partnerships to deliver the desired outcomes.

The intentions to deliver are linear and stepped. Improvement of service delivery is not alluded to, which highlights the difficulty that is evidenced in the organisation, pressured to deliver new functionality as promised but failing to make current services better and more user-friendly; there is

no opportunity to learn from what has been delivered allowing time (or budget) to reflect and progress on the quality of the systems and service that have already been delivered.

HIMSS – Digital Health Indicator

Factor	Evaluation	Rating	Justification
Driving policy and governance	Framework leading the plan and structure in place to support it.	9/10	Mention of driving policy and subsequent policies that have driven development, as well as WG documents that back the Plan.
Strategic objectives	Plan that aligns with goals and objectives encouraging innovation.	7/10	Each goal and objective is matched to its development/project. These are clearly defined. Yet, there is no room for learning and improvement, and the tight schedule of delivery would make it hard to do.
Target audience	Clarity on who it is addressed to. Demonstrates how the plan is embedded in the culture and how leadership encourages it. Clarity of content and engagement with stakeholders.	5/10	Unclear who target audience is – it is a public document, difficult to find, that mainly describes the internal roadmap of delivery. No internal knowledge of it. Unappealing to read. Leadership encouragement of the plan is not mentioned. Engagement with the stakeholders is not evident.
Data-driven and evaluation	Based on knowledge of the organisation, building on that knowledge. Insight driving decision making. Evaluation of the impact of the proposed strategy. User satisfaction and patient benefits.	5/10	User engagement is not evident throughout it. The developments seem coherent and necessary, however, their specific relation to staff and patients is not readily visible. There are sections for staff and patient empowerment, but no direct participation is mentioned or if feedback has been provided in relation to the systems.
Infrastructure	Building the infrastructure required and operational processes to maintain it.	6/10	There is an acknowledgement of the need to replace outdated infrastructure and legacy (unsupported) systems after failure of short-term investments, but there is no defined pathway of how to achieve that. Mention of Cloud procurement and requirements for data-centre migration
Resource and budget	Sources of revenue. Reliability.	7/10	Financial aspect is outlined and clear at a high-level. There is an unacknowledged risk for the renewing funding and resourcing related to non-renewable sources of income, which could threaten the delivery of systems dependant on it if delayed
Workforce	Staff recruitment and retention. Leadership within organisation.	6/10	Aim to ensure skill mix necessary, and retention while growing in size. Difficulty in recruiting for strategic posts is not mentioned. The Plan does not mention that the retention from previous organisation was high – which is a benefit. Leadership is mentioned as one of the aims.

Table 1: Summary of HIMSS evaluation on DHCW's Plan.

This plan has a data-driven approach and uses graphing to portray meaning, which could have been used to help reduce the written text as the use of the diagrams is clear and more engaging. There is a strong focus on the short and medium-term objectives and plans to accomplish these; there is no distinctly defined strategy for the long term which demarcates the path that the organisation is aiming to achieve and if it is realistic. Interoperability between systems is briefly mentioned and the core of the plan is project-oriented, which fosters a siloed way of working.

Resources and budget area is clear, concise and seems transparent. A quarter of the funds come from non-recurrent funding, which could become a liability if programmes are not delivered on time for any reason. This is currently happening with one of the major systems that is yet to be delivered, where the funding is coming from a non-renewable source, making it difficult to progress. This aspect, which is a risk, is not mentioned as such. Recruitments to vacancies are mentioned as part of the budget risks.

In regard to the Workforce, aside from vacancies being considered in the *Financial* section, there is mention of areas of challenge and how the plan sets the actions to be undertaken to undertake those challenges. The use of graphs aid in the description of the demographics (gender and age) and provide an estimation of the expected growth. Staff recruitment and retention of such a highly specialised workforce is not plainly described as a risk.

In all, the HIMSS analysis focuses on factors that are interdependent, and addressing each of them is critical to developing a comprehensive and effective digital health strategy. This Plan, addresses them and shows signs of interrelation between the factors.

On the other hand, the PESTLE framework focuses on the analysis of external factors that can influence the delivery of a digital transformation. By evaluating these factors, the organisation can plan ahead and mitigate risks or have planned strategies in case of manifestation of any unplanned scenario. There is, however, a difficulty in performing this analysis with a Plan that is an internal document and roadmap for the organisation and is not strongly focused on the external pressures in its discourse. As a consequence, the analysis in most areas is weak. PESTLE is a complement to HIMSS analysis and is summarised in Table 2.

The first area is the political environment, which is only brushed upon and not fully addressed. There is a strong reference and foundation of the programmes and deliverables on WG strategies and documents, but these do not account for the evolving political landscape, neither does it address strategies to maintain stability in the organisation in case of political changes. Firmly related, is the

‘Economic’ aspect, of which external factors are not mentioned, except for DHCW being very reliant on WG funding.

PESTLE Framework

Factor	Evaluation	Rating	Justification
Political	Analysis of the political environment in which the organisation operates including government stability, taxes, political risks.	3/10	WG documents and desires are outlined and mentioned frequently throughout the document, but the political environment is not referenced to, or the possible risks arising from it. WG feedback on the plan is included in the narrative, pointing towards some of the shortfalls of the Plan.
Economical	Analysis of conditions like inflation, economic growth, interest rates that could impact the organisation.	3/10	The Socio-Economic Duty is mentioned as part of the ‘A More Equal Wales’, but conditions like inflation and interest rates are not directly mentioned,
Sociocultural	Analysis of factors such as demographics, cultural shifts, social changes that may affect the organisation and its workforce	5/10	Hybrid working and challenges on training and team building of newly onboarded staff is not contemplated. Since DHCW does not deliver front line care, social changes may be attenuated, and rise from within more gradually. The <i>Black lives matter</i> movement is mentioned. Creating equitable services is one of the main aims and mentioned in the ‘future’ section.
Technological	Analysis of technology landscape such as advancement, requirements, automation, frequency of update.	5/10	Advances are proposed to the different programmes. There is no focus on new technology being incorporated. Automation is associated to the concept of ‘Big data’ and included as an item in the graphing do ‘Information availability and Flow’ but it is considered as part of the Process and not linked to a specific technology. The description is vague.
Legal	Analysis of factors that influence such as new laws, GDPR, etc.	5/10	Information governance and cybersecurity are areas of concern to protect the data that is being held by DHCW. Areas of high impact like Duty of quality and candour came into force only this year so these are not present in the document, however, could have probably been considered in anticipation, in a similar fashion as the changes in medical devices regulation are introduced.
Environmental	Analysis of factors involving climate change, CO2 impact, environmental regulations, etc.	4/10	This aspect is presented as part of the responsibilities and as objectives, with no defined strategy for change. Currently, there is monitoring of impact. The legal requirement to comply with environmental legislation is mentioned.

Table 2: Summary of PESTLE evaluation on DHCW's Plan.

The *sociocultural* implications related to a context where COVID was still a major concern, are repeatedly alluded to. From the WG Feedback, the need to balance between the COVID-19 demands and maintenance of the Core business, highlights the frequent mention of the first, which should not shift the focus completely from delivering other key services. Other aspects of the social component are mentioned in the *Appendix*, where Welsh language, access to health and equality are tackled as part of the ‘Well-being and Future Generations Act’.

To achieve a rounded analysis, the NHS Providers guidelines provides a more technology-oriented assessment. Signs of a good digital strategy and their analysis are summarised in Table 3.

NHS Providers guideline

Factor	Evaluation	Rating	Justification
Integrated	Digital as an integral part of the strategy, promoting improvements.	9/10	Digital is at the core of DHCW, and delivering digital is the central aspect of the plan. Improvements are aimed at the user experience, delivering new functionality. It is more focused on delivering new functionality that improving the existing one.
User centred	Address the user (staff) needs, and patient requirements.	6/10	The strategy addresses the user-needs in terms of delivering new functionality. However, the users and patients, as in the other analysis, do not seem to have been queried to deliver this plan
Useful to teams	States the frameworks and guidance to delivery of technology.	5/10	The different teams within DHCW are provided with a visual graph of the proposed roadmap, and the standards delineating the boundaries within which they should work are alluded to but not named individually. (Generic standards)
Mainstream	Easy to understand and implement, unifying the different stakeholders on a common aim.	4/10	The common aim is diluted through the descriptions of the programmes and becomes blurry. It is very programme-oriented but there is no clear depiction on how to break the siloes in order to unify the teams.
Realistic	Achievable goals and a vision that demonstrates realistic outcomes that build on existing functionality.	6/10	DHCW needs to prove it is trustworthy and setting a very ambitious plan as this one can backfire if not delivered accordingly. However, if achieved, the organisation would become a very trusted partner. Reviewing a plan from 2021/2022 in 2023 allows the analysis to be more critical as achievement of set objectives, so far, is not complete.
Focused	Clear aims directed to what is in scope.	8/10	Aimed at each programme. These are many and very varied. Each has a detailed path. It would have been ideal to link the plan to each of the system’s documents to direct the reader to further information.

Table 3: Summary of NHS providers guideline evaluation on DHCW’s Plan.

Factors relevant to the NHS Providers guidance that have not been evaluated yet in the above analysis include the need for digital to be an integral aspect of the strategy. In this case, the plan leans heavily on the digital aspect of the delivery and focuses on the programmes being delivered with great detail, two strong aspects of this plan. Nonetheless, the usefulness for the teams is relative as standards are mentioned as generic items rather than established ones to direct the teams to their correct application.

The Plan is ambitious, with no clear consideration of time allocated in case of setbacks or incidents, making it less likely to be a realistic plan. This also relates to the fact that there is no mention of improvement for the specific workstreams or fostering communication between teams to deliver a holistic view centred in interoperability.

All in all, the Plan is a good starting point for the organisation to have a schema of direction. This could be further improved in two main areas: the first is the People aspect, both the resources/staff within the organisation and the users of the systems who could provide feedback. The second is the Improvement area, with a greater need for monitoring progress and achievements, which could be reported and linked to the benefits obtained from the system, also related to user feedback to guide the areas where enhancements can be done.

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