

Digital Strategy Implementation (Analytics)

Final Internal Audit Report

May 2023

Swansea Bay University Health Board

Contents

Executive Summary.....	3
1. Introduction	4
2. Detailed Audit Findings	4
Appendix A: Assurance opinion and action plan risk rating	10

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Executive Summary

Purpose


To provide assurance that the Business Intelligence (Analytics) function has an appropriate and effective governance structure, and the structure and function are operating effectively and as intended.

Overview

We have issued Substantial assurance on this area. We have no matters arising to include in this report.

The health board is moving towards being a data driven organisation and we consider its Business Intelligence Analytics function to be well placed to develop and progress analytics in support of its overall operation.

Report Classification

		Trend
 <p>Substantial</p>	Few matters require attention and are compliance or advisory in nature.	N/A
	Low impact on residual risk exposure	First Review

Assurance summary¹

Objectives	Assurance
Plan for delivery	Substantial
Resources	Substantial
Business information requirements	Substantial
Tools and technology	Substantial
Governance and oversight arrangements	Substantial

¹ The objectives and associated assurance ratings are not necessarily given equal weighting when formulating the overall audit opinion.

1. Introduction

- 1.1 Swansea Bay University Health Board's (the health board or organisation) Digital Strategy contains a capability strand relating to Business Intelligence (BI) and Analytics, and notes that an organisation-wide business intelligence and analytics capability is integral to the successful realisation of the benefits of investment in a digital strategy.
- 1.2 Currently deployed intelligence and analytics technology is primarily applied to structured data. However, emerging healthcare questions require implementation of newer technologies which allow deeper investigation of large volumes of semi-structured and unstructured data. New data discovery and visual analysis tools give non-technical users capabilities for performing what-if analysis and creating visualisations themselves, driving demand for access to suitable data.
- 1.3 It is envisaged that business intelligence and analytics processes will uncover insights about clinical pathways, experience and outcomes, and population health needs from the underlying data .
- 1.4 The risks considered as part of this audit were:
- Lack of appropriate management support, funding, and/or governance over the Business Intelligence & Analytics workstream, resulting in failure to meet strategic goals;
 - Ineffective technology solutions and/or configurations may result in a negative patient experience, reduced system availability, and/or degraded performance; and
 - Operational and strategic decisions are not data informed.

2. Detailed Audit Findings

- 2.1 The table below summarises the recommendations raised by priority rating:

	Recommendation Priority			Total
	High	Medium	Low	
Control Design	0	0	0	0
Operating Effectiveness	0	0	0	0
Total	0	0	0	0

- 2.2 Our detailed audit findings are set out below.

Objective 1: A plan for delivery of the Business Intelligence & Analytics workstream is in place and is subject to appropriate monitoring.

- 2.3 There is a 'Business Intelligence Strategy', approved in January 2022, covering the period 2022 to 2025 which is congruent with the health board's main Digital Strategy. It states that the digital ambition is to deliver actionable insights and intelligence to the organisation in order for clinicians, managers, executives and other stakeholders to make better informed decisions. The document was first drafted in 2020, however its formal launch and approval was suspended due to the Covid pandemic. It was subsequently updated and improved to account for developments and lessons learned since then and has now been formally approved.
- 2.4 The Business Intelligence Strategy is supported by a 'Digital Intelligence Implementation Plan', which has high level objectives over the three years. The plan adds a timeline to the Strategy and provides target dates for key activities. Given the current position and leadership commitment we consider that the dates seem reasonable and achievable.
- 2.5 There is a defined governance structure (see objective 5). A progress report was issued in July 2022 noting the implementation of the Business Intelligence Strategy remained on track for delivery by 2025 and advising of current issues and progress. These include:
- Recruitment: progress has been made in this area, however the report noted that the department is still four posts short of a full compliment (now complete as per paragraph 2.9).
 - The new data warehouse (Enterprise MS SQL Server) has been created and the old infrastructure is largely migrated ready for new features and functionality to be installed.
 - All Power BI reports are now available on mobile devices via the Power BI app for Android and Apple. This functionality will be part of the data literacy programme education piece.
 - No data has been transferred to or from the National Data Resource (NDR) due to this platform not being available yet. However, Digital intelligence have a number of data flows ready to send to it once it is up and running. Estimated delivery of this is currently to be confirmed, but likely to be early 2023 (progress made as per paragraph 2.24).
 - Good progress has been made towards the establishment of a data value and literacy programme with a portal, blog and other infrastructure ready to be published for August 2022. However, ongoing conversations are being had nationally with HEIW, NDR and the Welsh Modelling Collaborative in order to bring other national resources into this much needed programme to ensure a standardised approach is applied. These national programmes are currently lacking in content and the health board is working with them in order to help deliver and shape the content and approach (see also paragraph 2.23).

Conclusion:

2.6 We are satisfied there is a structured and achievable Business Intelligence Strategy, supported by a delivery plan and appropriate reporting process. We therefore award **substantial assurance** for this objective.

Objective 2: Resources for delivery of the Business Intelligence & Analytics and the required workstream have been identified.

2.7 We note that analysts and a data warehouse team were already operating within the health board's Digital Team, producing outputs (dashboards) for various business areas prior to the development of the 'Digital Intelligence Resource Proposal', which was presented and approved in April 2021. Its purpose was to request additional funding to support the expansion of the Digital Intelligence Team to directly support Service Groups and the delivery of the annual plan.

2.8 The proposal was to increase the business intelligence resource, with the addition of four new business partners according to the Digital Team's current (at the time) and expected future demands. It was based on what had been effectively delivered to date, the known backlog, and expected growth areas. The proposal for increased resources included costings and a job description detailing the key tasks the new business partners were expected to perform.

2.9 The proposal was approved and detailed job and person specification produced. The Business Partners were recruited and allocated to the four main Service Delivery Groups (SDGs):

- Morriston Hospital;
- Singleton/Neath Port Talbot Hospitals;
- Mental health, learning and disabilities; and
- Primary care and community therapies.

2.10 Future skill needs are kept under review. The health board's Digital Team support staff through a masters degree course at Swansea University. We note that this has been promoted as a recruitment opportunity which has already resulted in a student being recruited into the team.

2.11 Another route used to acquire updated skills is shadowing. Para 2.23 mentions National Language Processing (NLP). An external specialist was contracted for 12 months with the remit of developing the functionality and a specific individual within the team to continue the work after the contract ended. This was successfully achieved and has resulted in the skill being developed in-house.

Conclusion:

2.12 We are satisfied that the Business Intelligence & Analytics workstream is adequately resourced and the addition of BI Partners working directly with the SDGs has been a successful model. We note that with the ever increasing demands for information intelligence, this position should be reviewed annually in line with the organisation's IMTP to ensure that as business demands and technologies change, the skills required for this team are supported which may involve further

investment into the team in the future. We award **substantial assurance** for this objective.

Objective 3: A process to assess and understand the business information requirements of the organisation is in place, and to deliver analytics accordingly.

2.13 The Business Partners play a key role in the ongoing development process, which has an agile management style. Sharepoint is used to manage all project requirements and tasks. It is updated, continuously live and accessible to all.

2.14 The process whereby the Business Partners understand and assess SDG requirements (within analytics) is set out as follows:

- Business Partners meet their respective SDG on a weekly basis, or as needed depending on the work required.
- The Business Partners then meet as a group, typically every Friday, to discuss all SDG requirements.
- A full meeting of the Business Partners, Analysts, and the Data Warehouse Team then follows every Monday afternoon, which sets the working agenda for the week.
- A design meeting is then held every Wednesday, the purpose of which is to discuss scope requirements. Unlike the meetings noted above which are formally minuted, these are operational meetings where notes and actions are captured and updated within sharepoint.

2.15 There is an additional route that allows any individual or group/team/unit within the health board to request access to digital intelligence products, changes to existing ones and the development of new bespoke ones. This can be done via the Business Intelligence digital portal, which is easy to locate and access in the health board's intranet. The request screens are easy to find and intuitive to use.

2.16 The primary delivery method for analytics delivery is through a dashboard. These are an acceptable and practical way to deliver analytical information and provide data to requestors. They are delivered onto the digital portal using Microsoft Power BI with functionality supporting drilldown, filtering and modification, along with the ability to export to Excel, Powerpoint, pdf, as required.

2.17 Access to dashboards is controlled by the Digital Team, where requests made via the digital portal. If individuals attempt to access a specific dashboard or report is denied, they are automatically presented with an option to request access. When tested the required permission was granted quickly and efficiently.

Conclusion:

2.18 There is a robust process in place which enables the Business Partners to understand and assess SDG requirements. We are also satisfied processes exist that facilitate any individual staff member, team, group or unit accessing assistance and support from the Business Intelligence Team. We consider **substantial assurance** appropriate for this objective.

Objective 4: A process is in place to identify the most appropriate tools and technologies to fit the current and future needs. These tools should enable the organisation to acquire, process, analyse and use data from sources that produce increasing amounts of structured and unstructured data.

- 2.19 The Digital Directorate originally created its dashboards using Qlik View. This tool was originally acquired by finance to produce dashboard style reports for budget holders. Its use was expanded by the Digital Directorate subsequently, to produce dashboards for any area of the organisation that requested this type of reporting. We noted that 18 dashboards and 30 reports are currently available via the digital portal.
- 2.20 Microsoft Office 365 has been procured by all NHS boards. It includes its analytical reporting tool Power BI which is now available to all users. This is an alternative and more modern reporting tool which is a suitable alternative to replace Qlik View. It is becoming the NHS Wales de-facto standard for reporting. The Business Intelligence Team is in the process of reviewing dashboard usage, replacing those that are needed with power BI versions and archiving those no longer required.
- 2.21 Although the count of dashboards is comparatively low when compared to other organisations, the controlled approach to their creation is appropriate, it prevents duplication and an over proliferation of unnecessary dashboards that are not for regular management and control activity.
- 2.22 The Digital Directorate is also considering the development of future modelling capabilities, and is working with Digital Health Care Wales to deliver national data structures on the National Data Resource (NDR) and the Clinical Data Resource (CDR). A project is due to start in April 2023 within the health board to work with the NDR and CDR groups to determine the future architecture and structure requirements and how the local architecture can be developed to fit the local and national needs.
- 2.23 As the process develops the health board will consider future modelling which may include use of appropriate tools and software, such as the 'R' modelling language and Facebook Prophet for predictive analysis. The Digital Directorate will look to use the 'best tool for the job', at the time it is needed whilst continually reviewing the process and tool requirements.
- 2.24 Currently, the health board has an internal project with the aim to expand data sources and improve the use they can make of 'unstructured data'. For example, it is currently working with Natural Language Processing (NLP) in relation to patients discharge advice letter. This uses algorithms to glean any additional information from the letter which can be added to patient and general area profiles to help refine any future forecasts.

Conclusion:

- 2.25 We are satisfied that the processes for identifying and using appropriate tools and technologies to support the analytical function is operating effectively and consider **substantial assurance** appropriate for this objective.

Objective 5: A governance structure is in place with regular reporting and monitoring of plan delivery, with clear oversight arrangements to support escalation of risks and issues.

2.26 The Business Intelligence Strategy defined a formal governance structure for Digital Services, with a clear reporting and escalation route through the management structures of the health board. As noted in Audit Wales' Structured Assessment report: '*Digital goals and timescales are clearly set out in the 2022-25 IMTP and monitored through the Board, and Performance and Finance Committee.*'

2.27 The Digital Transformation Leadership Group (DTLG) and the Digital Intelligence Prioritisation Group (DIPG) are the key decision-making groups. Both are appropriately structured, with Terms of Reference defining key areas of responsibility, membership, reporting and scheduling.

2.28 The purpose of the Digital Transformation Leadership Group (DTLG) (previously named as the Digital Intelligence Leadership Group (DILG)) is to provide robust governance and assurance for the delivery of the Health Board's digital vision. The Group reports into the Management Board and is charged with steering, governing, supporting and performance managing the planning and execution of a Digital Strategic Plan, in order to take full advantage of the digital opportunities.

2.29 The purpose of the Digital Intelligence Prioritisation Group is as follows:

- Monitor progress of agreed work packages for the previous month;
- Review, prioritise and agree work packages for the next month;
- Ensure relevant operation, clinical, finance and digital stakeholders are sighted and agreed on priorities;
- Resolve any issues and escalate when appropriate; and
- Report directly into DILG.

2.30 Review of minutes has confirmed that both groups are operating as intended, with regular monitoring of progress against the activities that will deliver the Business Intelligence Strategy. Whilst we note that the implementation of the Strategy is on track, we recognise that the health board is only at the end of the first year, and so it remains in the early stages.

2.31 Risk Management is operating as per board policy and accepted best practice. Digital risks are discussed at a Digital Risk Meeting, with escalation to the Digital Business Meeting and Management Board if required. We note that a wider risk in relation to staff resources and recruitment is included within the Digital risk register and that this has been escalated to the corporate Health Board Risk Register.






Conclusion:

2.32 The governance of the Business Intelligence function is operating as it was designed, and is providing a sound structure for its overall leadership and operational oversight. We consider **substantial assurance** appropriate for this objective.

Appendix A: Assurance opinion and action plan risk rating

Audit Assurance Ratings

We define the following levels of assurance that governance, risk management and internal control within the area under review are suitable designed and applied effectively:

	Substantial assurance	Few matters require attention and are compliance or advisory in nature. Low impact on residual risk exposure.
	Reasonable assurance	Some matters require management attention in control design or compliance. Low to moderate impact on residual risk exposure until resolved.
	Limited assurance	More significant matters require management attention. Moderate impact on residual risk exposure until resolved.
	No assurance	Action is required to address the whole control framework in this area. High impact on residual risk exposure until resolved.
	Assurance not applicable	Given to reviews and support provided to management which form part of the internal audit plan, to which the assurance definitions are not appropriate. These reviews are still relevant to the evidence base upon which the overall opinion is formed.

Prioritisation of Recommendations

We categorise our recommendations according to their level of priority as follows:

Priority level	Explanation	Management action
High	Poor system design OR widespread non-compliance. Significant risk to achievement of a system objective OR evidence present of material loss, error or misstatement.	Immediate*
Medium	Minor weakness in system design OR limited non-compliance. Some risk to achievement of a system objective.	Within one month*
Low	Potential to enhance system design to improve efficiency or effectiveness of controls. Generally issues of good practice for management consideration.	Within three months*

* Unless a more appropriate timescale is identified/agreed at the assignment.



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