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Acknowledgements

The Editorial Board would like to acknowledge the assistance provided by the Department of Information (DOI).

This is a peer reviewed journal that involves a double review.

This is the fifth year of the Institute for the Public Services publication.

As we launch the 2025 edition of our journal, the Institute for the Public Services (IPS) proudly reaffirms its role as a dynamic platform for exchanging ideas between academics and public officers.

This publication remains a cornerstone in capturing research, reflective practices, and insights that continue to shape the evolving landscape of public administration. The Institute has undergone a purposeful transformation in recent years, reimagining research and training ecosystems to create a more agile, holistic, and forward-looking Public Service. Guided by evidence-based strategies, the vision is not merely to respond to change, but to anticipate and lead it with clarity, resilience, and courage. At the heart of this transformation is innovation. The IPS has the talent, tools, and tenacity to take bold steps forward. From cultivating a culture of inspirational leadership to investing in advanced digital infrastructure, the IPS is committed to continuous improvement. Today, the integrated physical and digital training environment is a resilient, excellence-driven network.

Every programme is powered by a dedicated team of tutors and administrative professionals who consistently deliver impactful learning experiences. Their commitment ensures that quality is never compromised, even amid evolving demands. At IPS, mediocrity has never been an option.

We are also redefining what accessibility means in the modern age. We aim to empower public officers with tools that enhance productivity and reduce administrative load. A key initiative now underway is the upskilling of ministry directors in training needs analysis, ensuring that learning interventions are not just well-targeted but truly transformative. In parallel, we continue to strengthen partnerships with trainers to elevate the quality and accessibility of online learning platforms. This journal is more than a collection of articles; it reflects progress, our values, and a vision for what lies ahead. We invite you to explore its pages, engage with the ideas within, and join us in shaping a Public Service that is smarter, stronger, and more responsive than ever.

Mr Keith Bartolo
Principal, Institute for the Public Services

Strengthening the Future of Public Service: The IPS in 2025

The Institute for the Public Services (IPS) is proud to be a cornerstone of Malta's Public Administration.

We are dedicated to providing continuous training, development, and innovation. IPS remains that our public officers are well-equipped with the tools, knowledge, and mindset they need for a high-performing, future-ready service. Our ongoing investment in advanced infrastructure, data-informed leadership, and improved digital capabilities showcases our unwavering commitment to excellence.

Advancing Public Sector Research

In 2025, IPS proudly reaffirmed its strategic partnerships with the Malta College of Arts, Science & Technology (MCAST) and the University of Malta. By actively engaging in academic events like Freshers' Week and the Career Expo, the IPS continued to showcase an exciting array of student schemes and apprenticeship opportunities within the Public Service. This effort is all about strengthening the connection between education and employment, bridging the gap between academia and real-world application. IPS has further supported undergraduate and postgraduate students throughout their dissertation journeys. With a keen focus on research proposals that align with the core priorities of public institutions and citizens, IPS is dedicated to nurturing a new generation of researchers. Their important work contributes directly to policy innovation and enhances service delivery. Looking ahead, IPS is excited to launch a nationwide research initiative to pinpoint skills gaps among public officers. This project promises to provide valuable insights into how we can nurture talent, ensuring ongoing development and innovation across public roles.

A New Digital Learning Horizon

Taking a bold step towards expanding learning access, IPS has partnered with Coursera, a global leader in online education. This collaboration empowers public officers with on-demand access to a rich library of courses delivered by world-class universities and institutions. From technical upskilling to leadership development and strategic thinking, officers can pursue flexible, tailored learning paths that align with the evolving needs of the Public Service. This initiative marks a significant shift in how IPS delivers education, blending Malta's local service context with global best practices. It ensures that every public officer, regardless of role or location, can benefit from high-quality, internationally recognised learning opportunities.

Expanding Student Schemes with Impact

Under the leadership of a newly appointed director, IPS is revitalising its student engagement strategy through an enhanced suite of apprenticeship and traineeship programmes. These are no longer viewed as temporary placements but as structured, meaningful experiences that connect academic theory with practical application. Participants are immersed in real service environments where they can develop soft skills, apply classroom knowledge, and gain firsthand insights into public sector operations. This experiential learning approach supports early professional development and establishes a robust pipeline of future-ready talent committed to national service. Furthermore, IPS is exploring new collaborations with ministries and government departments to further refine these schemes, ensuring they remain relevant, adaptive, and aligned with the ever-evolving demands of the Public Service.

Contributor Bios

Prof. Vincent Cassar

Professor Vincent Cassar is Professor of Organizational Psychology at the University of Malta and Fellow of the Centre for Evidence Based Management. He is presently Head of Department of Business & Enterprise Management in the Faculty of Economics, Management and Accountancy and coordinates the MA Programme in Evidence Based Management & Effective Decision Making.

Dr Jacqueline Vanhear

Dr Jacqueline Vanhear, a seasoned expert in educational quality assurance currently serves at the University of Malta's Quality Support Unit, where she collaborates with staff and students to strengthen internal quality assurance mechanisms. Formerly Director of the Quality Assurance Department within Malta's Ministry for Education, she played a key role in shaping national policies and regulatory frameworks for early childhood and compulsory education. With over 30 years of experience and a research focus on learner variability and meaningful learning, Dr Vanhear brings pedagogical insight to her work. She views quality assurance as a strategic driver of educational excellence.

Dr George Dimech

Dr George Dimech studied at the University of Reading, the College of Estate Management in the UK, and the University of Malta graduating in Management, Business Administration, and Arbitration, specialising in quality management and various construction-related aspects at master's and doctoral levels. He is a chartered member of RICS and CIArb, with over 35 years of experience in public and private sector leadership roles, including CEO, managing consultant, arbitrator, project manager and quantity surveyor. Dr Dimech coordinated numerous international and local strategies, projects and lectured at universities, technical institutes, and academies. Currently, he is spearheading the Agency's strategy and serves as the first Head of the Agency's Research and Development Department responsible for Quality Assurance, User Research, and Service Design, all of which aim to improve citizens' user experience and the Agency's Total Quality Management approach.

Mr Massimo Vella

Mr Massimo Vella holds a Master of Science in Information Systems Management and a Bachelor of Computer Science from the University of Greenwich. Having joined the Public Service of Malta in 1989, Mr Vella fulfilled various managerial and technical roles, was appointed Chief Executive Officer of Servizz.gov in August 2020, and had previously served as Chief Information Officer from 2012, spearheading projects such as simplification initiatives and strategic applications across numerous ministries. He contributed to initiatives including myHealth, the Electronic Exchange of Social Security Information, mServices, the Digital Tourism Platform – CONvErGE (ERDF 2.035) project, the Government Modern Workplace Initiative, and Digitalisation. Mr Vella has also contributed as a working group member to the attainment of various inter-ministerial initiatives such as the Mapping Tomorrow Strategy, the Social Media Policy, the National Cyber Security Strategy, the Tallinn Declaration and the Online Services Take-up Strategy.

Ms Francesca Mallia

Ms Francesca Mallia has been a qualified radiographer since 2004 and spent nine years working in emergency imaging before transitioning to administration in the ultrasound unit. Ms Mallia successfully completed an MBA in Public Health Policies, and more recently a Master of Arts in Evidence-Based Management. Alongside her professional career, Francesca is a certified yoga teacher and an active volunteer within a women's NGO.

Mr Steve Agius

Mr Steve Agius is CEO of Active Ageing and Community Care, leading services that support older persons to live with dignity, independence, and quality of life. Prior to this role, he worked as COO at Mater Dei Hospital and was responsible for the roll-out of the national COVID-19 vaccination programme. Steve also worked as CEO with Identita' and CIO with the Malta Communications Authority. Steve is also a Senior Visiting Lecturer at the Faculty of Economics, Management and Accountancy at the University of Malta. His PhD thesis is entitled "Leveraging Data for Strategic Decision-Making: Advancing an Intelligent, Data-Driven Triage System in Emergency Care".

Mr Karl Saliba

Mr Karl Saliba is a public officer working within the Maltese Public Service. Previously, he worked in the social services sector, where he gained hands-on experience in community support and development. He is currently pursuing a Master's in Evidence-Based Management and Effective Decision Making at the University of Malta. His main areas of interest are people management and evidence-based management, with a focus on applying data-driven approaches to enhance organisational effectiveness.

Evidence-Based Management: Practice implications for optimising decisions

Prof. Vincent Cassar

Keywords

Evidence-based management; decision quality; sources of evidence; PICOC; 6As; decision-making.

Abstract

Evidence-Based Management encompasses a series of knowledge-oriented practices aimed at improving decision quality. It achieves this by assessing and critically evaluating various evidence sources, including professional expertise, organisational data, scientific literature, and stakeholder values and intentions. By intelligently integrating these resources and adopting a more rational approach, the sustainability and management of risks in decision quality are enhanced. This article provides a high-level overview of EBMgt, utilising the principles of the PICOC framework and the 6As approach to clarify the general process of assessing the best actions based on the available evidence and its quality. Ultimately, EBMgt is not a strict formula; it demands leadership qualities in decision-making to ensure thorough exploration of options and to avoid biased selection strategies that could undermine potential courses of action.

Introduction

Consider the following scenario:
You are responsible for a public department that is experiencing significant inefficiencies, resulting in substantial management challenges due to escalating costs that jeopardise its financial viability. Furthermore, the department is failing to meet its targets, leading to considerable dissatisfaction among customers and clients, stemming from various negative experiences such as service delays and inadequate customer interactions. You have been assigned the task of addressing this issue and granted complete authority to determine the most effective solution. What course of action are you likely to pursue? A) Replace the personnel currently employed; B) Provide training to improve employee service; C) Abolish the activity entirely; D) Revise the internal Standard Operating Procedures (SOPs); E) Integrate the activity with another department.
All these options might be effective solutions; the typical answer would be, 'It depends.' This phrase, 'It depends,' serves as the central theme of this paper, which we will revisit later.

Handy (1991) illustrates a world that is undergoing continuous change, often appearing erratic and disjointed, thereby necessitating a re-evaluation of organisational structures and thought processes. In a similar vein, Taleb's (2005) concept of the Black Swan addresses the complexities of the contemporary world, where entities - be they governments, organisations, or individuals - are interconnected, rendering the anticipation of future events highly challenging, if not entirely unfeasible. Indeed, the idea of predicting, while simultaneously acknowledging the limitations in our capacity to foresee the future, was articulated years prior to the Black Swan concept by Herbert Simon (1986), who posited that our understanding of economics is frequently constrained by the necessity to reflect upon past events in order to anticipate future occurrences. This is, of course, only partly correct because patterns exist in the broader scheme of things that allow us to make intelligent guesses about the future. However, the specific details or degrees of accuracy are not always predictable, and many unknown unknowns often serve as new opportunities for learning. The point remains that today's world of work is riddled with complexities and risks that necessitate a more systematic way to make decisions, but allow us enough flexibility to go back to the drawing board to re-evaluate our courses of action. This need is also fuelled by the social, economic and geopolitical challenges the world has gone through and still goes through, making the way institutions function needs a more refined decision framework.

The Economist (2017) declared that data is the new oil. Data refers to raw facts, statistics, or information collected, stored, and analysed for reference, decision-making, or computation. Data can exist in various forms, including numbers, text, images, or signals, and can be structured (e.g. databases) or unstructured (e.g. social media posts). Data is, therefore, information. However, data, while being the basis of 'intelligence', is not evidence as it needs to be processed to allow us to make meaningful and effective inferences (Morgan, 1986).

Data to evidence: the fundamentals of decision-making

Decisions lie at the core of management practice. Decisions with long-term consequences that take shape in uncertain, often risky and complex ecosystems imply monetary, time and resources that require a delicate balance between anticipating the future and considering possible unknowns or discontinuities. Indeed, managers nowadays work in organisations where the social and economic topography is complex, which is therefore increasingly in need of undoing failed models of 'organisation' and developing new capacities to forecast and manage risk in the adaptation process. This requires a good affinity for turning data into applicable information and knowledge, but this is seldom straightforward. While these are interlinked processes, they exist in a perpetual cyclical fashion. Transforming data into information and knowledge is developmental and sequential. Humans may conveniently adopt a degree of selective attention to the most appropriate and valid data that can elicit applicable results because not all the information gathered can be justified with a favourable level of good evidence. Translating information through evidence into practice requires closing the gap between what is known and practised. Turning data into evidence and then into practice is a process of critical thought, insightful reflection and active questioning that utilises the best available evidence to plan one's course of action and weeding out the less-than-true evidence aside (Pfeffer & Sutton, 2006).

The Human Capability to manage evidence

The description above may show that the human brain may emulate what intelligence systems in AI are popularly thought to do (Kvam et al., 2024). However, the reality is that the human brain has limited information processing power, especially in contexts of uncertainty (Rousseau, 2020), and it may lack the power to override the external nuances that disrupt the 'rational' process. Social psychologist and Nobel Prize winner Daniel Kahneman proposed a dual systems theory of thinking (2003). The first (often called System 1) depends on intuitive processes that are fast, associative, effortless and emotional. Generally, we operate this way of thinking in decision-making when certainty is high, risk is low, and the consequences are likely to be meaningless. By contrast, the second (referred to as System 2) relies on a slow reasoning process governed by seeking evidence, being neutral to emotions, and requiring effort. It tends to be effective where complexity abounds, uncertainty thrives, and the consequences of our decisions can be immensely impactful. We often use System 1 too often, even when circumstances may demand a System 2 mode. It is not the scope of this essay to delve into this. However, the interested reader may consult the works of Kahneman (e.g. Kahneman, 2013) and some critical reviews on dual systems theory (e.g. Buturovic & Tasic, 2015; Evans, 2008).

Evidence-Based Management (EBMgt)

This is where Evidence-Based Management (EBMgt) principles may provide some alternative solutions to tackling complex problems or instances that require a deeper understanding of the long-term consequences of our courses of action. EBMgt may be best defined as using the best available evidence from various sources that enables a decision-maker to make a conscientious, judicious and explicit decision to allow the likelihood of the best possible outcome. In so doing, the decision-maker increases the possibilities of maximising the returns. It minimises the losses from his/her eventual actions, minimising the risk and making the decision more sustainable in terms of time, money and other resources.

In general, EBMgt relies on four specific sources of evidence. The first is professional expertise. People conversant in a specific subject matter have the knowledge, sometimes in tacit form, to judge and evaluate the type of issue they face. Professional expertise is a combination of knowledge, skills, and situational awareness that permits the 'expert' to have a more informed opinion than the rest of the population. More often than not, the expert will also rely on past experiences or familiar situations that he or she can use as a reference point and enable him/her to judge the possibilities of the way forward. The second source is organisational data. Organisational data can take all shapes and forms and may include financial, HR, Operations, IT or marketing data. This data can be assimilated into the decision-making process. They can be used to set norms, benchmarks, and predictions, sometimes using complex predictive models to explain trends, forecasts, or possible future scenarios. Indeed, technology has enabled us to use large data sets and evaluate patterns that would be invisible to the naked eye. The third source is the scientific literature. This source involves looking into the details of the subject matter and evaluating what the scientific findings tell us. It requires us to understand how and when patterns, relations, or causal mechanisms will likely happen to ensure a strong factual basis for the phenomenon we are trying to deal with or solve. The last source is the stakeholders. Stakeholders are any group, internal or external to the organisation, whose decision may directly or indirectly impact the organisation. Hence, understanding their viewpoints or influence is essential for a successful action.

As one may realise, each of these sources may not be without its limitations, and EBMgt is also about appreciating the pitfalls of each source.
For example, experts may have internal biases or suffer from discontinued links in knowledge due to various assumptions, sometimes leading to human error. Organisational data may also be subject to misrepresentation or be subjective or political, thus revealing a part of the broader picture. The scientific literature is also subject to pitfalls such as poor research design or, worse still, based on cooked data that fail to be spotted in the peer-review process, not to mention political agendas in scientific publications linked to funding or propagating a specific line of thought. Finally, stakeholder knowledge may also skew the decision, given that stakeholders may have the wrong reasons for objecting or may have a limited understanding of the broader consequences of their actions for the eventual decision. Moreover, decision-makers must be reminded that evidence is never perfect and can be misleading in many ways, as explained above. Sometimes, evidence may also be overstated.

Therefore, in EBMgt, the need to adopt skills that allow the decision maker to critically evaluate the sources of evidence and appraise (evaluate) each source is paramount. In doing so, the decision maker needs to weigh the use of the available evidence and the quality of that evidence. There is no magic wand in this, but in general, some basic techniques can be effectively used to increase the chances of a favourable outcome. We illustrate this using the scenario above.

EBMgt in practice

Good practices underlying EBMgt usually consider two essential points: (1) understanding the reason for the decision and (2) making the best decision after critically appraising the evidence. These two processes go hand-in-hand and require time and effort to ensure that System 2 operates rather than risking knee-jerk reactions to contaminate the process.

In the first instance, we utilise an arrangement system called PICOC. Each letter in the acronym refers to a specific element of the problem situation; hence, P refers to Population (who is the target of the intervention or may be affected by the intervention?); I refers to Intervention (what management technique will we adopt to effect the change?); C refers to Comparison (how does this intervention compare to other interventions? Is it more effective?); O refers to Outcome (what is it that you are trying to change or improve?); and C refers to Context (what is the type of organisation, or are there specific contextual realities you must be aware of?). Let us transpose the case scenario example into a PICOC (see Table 1):

Table 1: Using PICOC to structure the issue at hand

Population	Public officers who are client-facing
Intervention	Transformation and Re-design
Comparison	Other similar departments that are effective
Outcome	Improved customer experience; reduced delays
Context	A public organisation

Notice that changing one parameter may shift the focus of the issue to be addressed. For example, if the context were a school or a private organisation, the focal shift of acceptable actions would differ. The public service, for instance, may be subject to specific internal regulations that may not apply to a school or a private institution. Hence, the decision maker has clarity on what to focus on and prevents him/herself from borrowing practices that may otherwise backfire in this specific instance. PICOCs are often refined after several discussions to ensure they are clear and meet the project's purpose.

The next stage involves processing the PICOC using the 6As approach. The 6As represent a systematic method that utilises System 2 and avoids leaving any stone unturned. Table 2 provides what each 'A' stands for, including how we would translate our issue at hand against the 6 As:

Table 2: Description of the 6 As and typical applications, in brackets, for the example in this article

Ask	What is the question? (What is the root cause of deficiency in the Department?)
Acquire	What evidence is available? (Past survey results, Stakeholder reports, business data, meetings with heads, etc.)
Appraise	How trustworthy is the evidence? (Past survey results (6/10), Stakeholder reports (8/10), business data (9/10), meetings with heads (5/10))
Aggregate	What bigger picture do we have when we place all the evidence together? (After pulling ALL the evidence and weighing each source's trustworthiness against specific evaluation criteria, you deduce that the issue is related to lack of communication and low response time rather than structural problems).
Apply	How will we implement the recommendations that derive from the evidence? (D -> A -> B)
Assess	How do we ensure the intervention works? (In six months, we re-compare several specific metrics)

One appreciates that the 6A process above would require a lengthy discussion, but some highlights are noteworthy. First, the question requires one to focus on the underlying issue. Questions like 'How can the Department be improved?' imply a baseline and may require a different set of 'evidence', such as more customer feedback. Therefore, the question is critical and should not be underestimated. Second, obtaining the evidence that points towards the question is essential, and this is expected to happen without prior conditions or selective biases; indeed, any evidence that highlights the purpose of the question is adequate and should be consulted. Third, a format for appraising the evidence must ensure objectivity. Several techniques can be used, but in this example, we provided a simple weighting system from 1 (low) to 10 (high) to ensure a diligent process that permits us to weed out the low-quality evidence from the higher-quality evidence. Fifth, only after this process is completed can we bring all the evidence together (aggregate) and decide as objectively as possible which course of action is best in the circumstances and given the resources. For instance, in this example, the best choice is (i) changing the internal SOPs, followed by (ii) replacing some people and eventually (iii) training the employees to provide a better service, in that order, given the evidence. It may be that merely training alone would not have given the desired results, culminating in wasted resources. Alternatively, training may have been a better solution if the evidence we critically appraised indicated this is the best way forward.

Concluding note

This essay provided a very high level of appreciation of EBMgt and is meant to inform, rathern than, instruct about EBMgt. Using EBMgt principles should not be deemed a formula. Still, it should be implemented as a sign of 'good practice' that permits public officers to engage with complex decision-making issues using an approach that uplifts the quality of decisions to ensure a consistent and realistic outcome. One must appreciate that the benefits of EBMgt are far-reaching, as they help to reduce the element of risk and reflect good governance and accountability. EBMgt also reflects sustainability because courses of action indicate a high degree of logical consistency, thus diminishing subjective variability in decision-making.

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Quality Assurance in Public Policy Decision-Making

Dr Jacqueline Vanhear

Keywords

Quality Assurance, quality service, public policy, Key Performance Indicators (KPIs), external audits, data-driven governance, stakeholder engagement.

Abstract

This article explores the strategic role of Quality Assurance (QA) in enhancing public policy decision-making, with a focus on Malta's prevalent public service reform. By defining quality through measurable benchmarks and embedding Key Performance Indicators (KPIs) into governance frameworks, QA has transformed service delivery into a more transparent, accountable, and citizen-oriented process. The article highlights the complementary roles of internal and independent external audits, and stakeholder involvement as essential QA mechanisms. Emphasis is placed on the role of independent External Quality Assurance (EQA) in reinforcing objectivity, accountability, and good governance. The paper underscores the significance of stakeholder participation, feedback loops, and systematic follow-up mechanisms in reinforcing quality outcomes. A key highlight is the shift towards data-driven QA, using artificial intelligence and business intelligence tools to inform decision-making. By embedding QA, Malta exemplifies how strategic QA fosters effective governance, enhances service delivery, builds public trust, and ultimately better serves citizens' needs.

Introduction

The concept of quality service in public administration may be inherently complex, often subject to debate and varying interpretations. Multiple factors influence its definition and assessment, including institutional frameworks, stakeholder expectations, cultural contexts, and political dynamics. As a result, what constitutes high-quality service may vary significantly among policymakers, service providers, and citizens, making it a contested and, at times, inherently subjective notion (Van de Walle, 2018).

However, one of the key elements contributing to the success of public service reform in Malta in recent years has been the precise definition of quality service and the emphasis on measurable quality standards. By establishing clear benchmarks, performance indicators, and structured frameworks, Malta's public administration has sought to ensure that quality is not only a guiding principle but also an accountable and transparent aspect of governance, reinforcing trust and efficiency in service delivery (Bezzina, Camilleri & Marmarà, 2021).

With a strong focus on citizen-centric service delivery, Malta's Public Service reform was built on four foundational pillars: 'voice', 'design', 'delivery', and 'accountability'. These pillars provided a structured framework to define quality service and drive a culture of excellence in public administration. This well-defined concept of quality service was further strengthened through Key Performance Indicators (KPIs), which set clear, measurable targets to be achieved within specific timeframes.

These KPIs were strategically designed to enhance operational efficiency, improve service responsiveness, and bridge the gap between government services and citizens (Bezzina, Camilleri & Marmarà, 2021).

By explicitly defining quality service and embedding KPIs within performance management frameworks, Malta's public administration ensured that quality could be planned, measured, monitored, evaluated, managed, and continuously improved. This structured approach transformed service quality from an abstract and subjective concept into a concrete, data-driven commitment to excellence. As a result, it eliminated the risk of quality being reduced to "subjective rhetoric interpreted according to one's whim" (Cutajar, in Bezzina, Camilleri, and Marmarà, 2021, p. ix), fostering a more transparent, accountable, and citizen-oriented public service.

This approach aligns with the Plan-Do-Check-Act (PDCA) cycle, a fundamental methodology in quality management (Deming, 1986). The PDCA cycle consists of four iterative stages: planning improvements (Plan), implementing changes (Do), evaluating performance against set targets (Check), and refining processes based on feedback (Act). By following this model, Malta's public service avoids stagnation and promotes adaptive governance, reinforcing a culture of continuous improvement and accountability in public administration (Evans & Lindsay, 2017).

Consequently, Quality Assurance (QA) was pivotal in successfully transforming Malta's renewed public service. By embedding QA principles into governance frameworks, public administration ensured that service delivery remained transparent, efficient, and aligned with citizens' needs. The strategic use of KPIs and QA mechanisms has led to measurable improvements in public service delivery, resulting in better citizen outcomes. Continuous monitoring, feedback, and data-driven decision-making have streamlined operations, reduced inefficiencies, and enhanced service quality. For example, at Servizz.gov, KPIs and a standard QA framework improved response times and increased first-contact resolution, boosting citizen satisfaction (Servizz.gov, 2025). Similarly, the Malta Tax and Customs Administration (MTCA) digital tax services benefited from KPIs and quality checks, leading to faster processing, fewer errors, and increased online submissions (MTCA, 2024).

This article explores how Quality Assurance is a strategic instrument in public policy decision-making, emphasising its role in enhancing accountability, driving continuous improvement, and fostering public trust. The discussion focuses on internal and external quality audits, stakeholder involvement, and using evidence-based data to inform policy decisions. Furthermore, it underscores the critical importance of independent external audits, highlighting their role in ensuring objectivity, preventing conflicts of interest, and reinforcing good governance within Malta's public sector.

Quality Assurance in Public Policy and Administration

In public policy and administration, quality assurance encompasses the systematic monitoring and evaluation of various aspects of a project, service, or facility to ensure that quality standards are being met and to foster continuous improvement. This process is integral to public policy, as it provides a framework for evaluating the effectiveness of policies and their implementation based on evidence, stakeholder feedback, and audit findings, thereby facilitating informed decision-making. Quality Assurance (QA) mechanisms enable public administration to:

a) **Assess policy effectiveness;**

b) **Ensure compliance;**

c) **Enhance transparency and accountability;**

d) **Improve service delivery.**

In Malta, QA is embedded across various public sector institutions, including education, healthcare, and financial regulation. A key feature of effective QA is its dual focus on accountability and continuous improvement, ensuring both responsibility for outcomes and the ongoing enhancement of policies and services. The complementary role of internal and external audits is especially crucial in maintaining high standards and informing decision-making, while continuously evolving to meet societal needs.

Internal Quality Assurance Audits

Internal Quality Assurance (IQA) audits are assessments carried out within a public institution to evaluate performance, ensure compliance with regulations, and identify areas for improvement. These audits serve as self-regulatory mechanisms that allow government entities to identify inefficiencies before external audits take place.

Public entities in Malta, including ministries, educational institutions, local councils, and government agencies, conduct internal audits as part of their governance frameworks. Examples of IQA mechanisms include:

- **Ministerial Internal Audits:**

Government entities have internal audit units that evaluate policy implementation and ensure compliance with national regulations.

- **Educational Institutions:**

The University of Malta (UM) has internal quality assurance processes in place to monitor academic standards and institutional performance.

While internal audits are valuable, they must be complemented by external quality assurance audits to ensure objectivity and avoid conflicts of interest. Internal audits have limitations since they are conducted by departments within the same organisation, and therefore there is a risk of bias or lack of enforcement. This is one of the reasons why external audits are crucial for independent verification.

External Quality Assurance Audits

External Quality Assurance (EQA) audits involve independent assessments conducted by external bodies to evaluate an organisation's compliance with established standards and the effectiveness of its internal quality assurance mechanisms. These audits provide an objective perspective, identifying strengths and areas for improvement that may not be evident internally and are free from internal bias.
Examples of EQA audits include:

The Malta Further and Higher Education Authority (MFHEA), previously known as the National Commission for Further and Higher Education (NCFHE), is the regulatory body responsible for conducting external quality assurance audits of further and higher educational institutions. It was established through the Further and Higher Education Act (Chapter 607).

The National Audit Office (NAO) is an independent institution responsible for auditing government expenditures and evaluating the efficiency of public sector operations. Established under the Constitution of Malta, the NAO provides an unbiased assessment of whether public funds are managed responsibly and whether government policies are implemented effectively.

The Critical Role of Independent External Quality Assurance

While External Quality Assurance (EQA) is a crucial complement to Internal Quality Assurance (IQA), its true effectiveness lies in its independence from public administrative structures. Independent EQA audits provide an objective, impartial assessment of an organisation's operations, ensuring that evaluations remain free from internal biases or external pressures. This autonomy is essential to upholding transparency, credibility, and accountability in public sector governance.

By ensuring that audit findings and recommendations are based on objective evidence, independent EQA strengthens public institutions' commitment to continuous improvement (OECD, 2019). However, when EQA lacks independence, there is a significant risk that recommendations will not be adequately followed up, reducing audits to a mere bureaucratic exercise rather than a catalyst for genuine improvements. Without rigorous follow-up, systemic inefficiencies persist, stagnating progress and weakening institutional resilience.

Furthermore, independent EQA audits safeguard against complacency and political interference, preventing public institutions from disregarding or diluting recommendations that may be inconvenient or challenging to implement (Pollitt & Bouckaert, 2017). Any form of EQA that lacks full autonomy risks being superficial, creating an illusion of oversight while failing to drive substantive improvements.

Ultimately, the independence of EQA audits is indispensable to good governance.

A compromised audit system leads to reduced accountability, unchecked inefficiencies, and diminished public confidence in government decision-making—all of which threaten the integrity of public administration (Institute of Internal Auditors, 2012).

Stakeholder Involvement in Quality Assurance

Stakeholder involvement is a cornerstone of Quality Assurance (QA) in public administration, since it ensures that policies, operations and services are inclusive, transparent, and responsive to societal needs. Public administration must actively engage a broad spectrum of actors, including government officials, civil society organisations, businesses, and citizens, to develop and implement policies that reflect real-world challenges and expectations (Bryson, Quick, Slotterback, & Crosby, 2012; Ansell, Sørensen, & Torfing, 2020).

In Malta, stakeholder participation is institutionalised across various sectors, demonstrating the country's commitment to an inclusive and consultative approach to policy-making:

- **Educational Institutions:** The Malta Further and Higher Education Authority (MFHEA) requests higher education institutions to involve students, staff, employers, and industry representatives in External Quality Assurance (EQA) processes. Similarly, the University of Malta (UM) engages both internal and external stakeholders in Annual and Periodic Programme Reviews, strengthening Internal Quality Assurance (IQA) mechanisms.

- **Public Consultations:** The Maltese government frequently conducts stakeholder consultations before implementing major policy changes, particularly in areas such as education, environmental regulations, economic reforms, and healthcare policies. These consultations ensure that diverse voices are considered, improving policy legitimacy and effectiveness.

- **National Audit Office (NAO) Engagements:** The NAO gathers feedback from ministries, agencies, and the general public when conducting audits, ensuring a comprehensive and transparent approach to EQA.

While stakeholder involvement strengthens the legitimacy of public policies, it must also be meaningful and actionable. Feedback collection should not be treated as a mere formality; instead, data must be rigorously analysed, interpreted and integrated into the decision-making process (OECD, 2020). Entities must make use of a range of participatory tools, such as satisfaction surveys, focus groups, digital platforms, and deliberative consultations, to capture diverse perspectives and improve service delivery. Both IQA and EQA benefit from using multiple data collection methods, ensuring that stakeholder insights are continuously leveraged for policy refinement and service enhancement.
By embedding structured stakeholder engagement into QA frameworks, public administration can foster greater accountability, promote evidence-based governance, and enhance public trust in policy outcomes.

Closing the Feedback Loop in Quality Assurance

Closing the feedback loop involves implementing changes based on feedback received and communicating these changes back to stakeholders. Accountability and continuous improvement, the two facets of Quality Assurance (QA), require that audit findings and stakeholder feedback be translated into SMART (Specific, Measurable, Achievable, Relevant, Time-bound) action plans (OECD, 2020). This ensures that feedback is not merely collected but actively used to drive tangible improvements, enhancing transparency, responsiveness, and public trust. By embedding structured follow-up mechanisms, public administration can move beyond compliance to foster a culture of continuous quality enhancement, ensuring that public administration evolves to meet societal needs effectively. Integrating stakeholder input into decision-making strengthens governance, reinforces institutional accountability, and ensures that quality assurance processes lead to measurable and impactful improvements in public service delivery.

This process may be reinforced through:

a) **Implementation of Audit Recommendations –** Entities should develop a tangible action plan outlining specific measures to address the recommendations emerging from the External Quality Assurance (EQA) audit. This plan should include clear timelines, assigned responsibilities, and measurable targets to ensure effective follow-through and accountability. For example, Ministries and agencies are required to act on National Audit Office (NAO) findings and report on corrective actions taken. Similarly, following the 2023 EQA audit by the Malta Further and Higher Education Authority (MFHEA), the University of Malta (UM) was required to submit a comprehensive action plan. UM adopted a bottom-up approach, engaging a diverse group of students, academic and administrative staff to increase ownership and facilitate effective implementation. This inclusive strategy ensured that the action plan reflected broad institutional input, fostering commitment to quality enhancement. The final action plan was formally endorsed by UM's Senate, reinforcing its institutional significance and commitment to continuous improvement in alignment with EQA standards.

b) **Follow-Up Audits –** These are essential to close the quality cycle and ensure that previous audit recommendations have been effectively implemented, providing accountability, assessing progress, and identifying any persisting gaps that require further action. For example, the NAO follows up with the respective entities as to the degree to which the recommendations have been implemented. Likewise, the MFHEA follows up on its EQA audits by requesting a progress implementation record of the action plan one year following its submission.

c) **Public Reporting –** Audit reports are published to ensure transparency and accountability (Behn, 2018). For example, the NAO publishes its audit reports which are made publicly available on the NAO's official website. Similarly, the MFHEA publishes EQA audit reports along with the action plans of the institutions that have undergone the audit process. Public reporting provides transparency regarding the findings and the steps taken by institutions to address the recommendations made during the audit.

The Government of Malta, through the Governance Action Directorate under the Office of the Principal Permanent Secretary (2024), actively monitors the implementation of NAO recommendations using robust quality assurance mechanisms. Each year, following the NAO's report, the Directorate engages directly with relevant ministries, reviewing actions taken on highlighted issues within set timeframes. These responses are assessed and, where necessary, forwarded to the Internal Audit and Investigations Department (IAID) for further scrutiny. Closure meetings ensure thorough follow-up, and the finalised outcomes are published annually. For example, the Governance Action published in 2024 portrays a consistent increase in implementation, with the latest rate reaching 92.2%. This systematic process reinforces accountability and ensures continuous improvement in public sector governance.

Data-driven Quality Assurance

In Quality Assurance (QA) for public policy decision-making, while stakeholder feedback is a critical component, it must be complemented by data-driven intelligence to ensure policies are not only responsive but also strategically informed. Evidence-based decision-making in public administration extends beyond qualitative insights from stakeholders; it increasingly relies on Artificial Intelligence (AI) and Business Intelligence (BI) solutions to generate predictive analytics, identify patterns, and enhance decision-making accuracy. AI-driven data analytics can process vast amounts of structured and unstructured data, offering real-time insights that improve the efficiency and precision of internal audits and policy evaluations. By integrating machine learning models, predictive analytics, and automated reporting tools for QA purposes, entities can proactively detect inefficiencies, anticipate policy impacts, and enhance transparency.

Bezzina, Camilleri, and Marmarà (2021) highlight that the unprecedented investment in technology was a key driver behind the successful Malta eGovernment reform, positioning the country as a leader in digital governance within the European Union. Malta's public service stands out in the EU for its extensive usage and broad spectrum of digital services, with a high uptake across platforms like Servizz.gov, offering over 1,500 services that span healthcare, taxation, social benefits, and licensing (European Commission, 2024). This is further supported by the National Statistics Office (2025), which confirms that between 2023 and 2024, the number of e-Government users increased by 6.9%, with 81.1% of internet users in Malta engaging with e-Government services. The Servizz.gov Annual Report (2025) highlights how data-driven insights are enhancing service delivery. By analysing usage trends, the agency improved responsiveness and efficiency. Notably, Freephone 153 saw a 31% increase, while website visits rose by 11%, and chatbot and email interactions grew by 23% and 24%, respectively. This evidences how data can effectively improve service delivery, ensuring services are more accessible and responsive to citizens' needs.

Therefore, public administration must continue to invest in these technologies to strengthen internal audit functions and ensure that QA processes are built on robust, data-driven foundations rather than solely on subjective feedback. As Janssen, van der Voort, and Wahyudi (2017) emphasise, leveraging big data and AI in public administration enhances accountability and evidence-based governance, reducing reliance on intuition and improving policy outcomes.

For example, the University of Malta (UM) integrates Microsoft Power BI into its Internal Quality Assurance framework, enhancing data-driven decision-making and continuous improvement. This initiative enables systematic data collection, analysis, and evaluation, fostering transparency and accountability. Interactive dashboards and reports provide insights into student and staff performance, supporting evidence-based institutional decisions.

Conclusion: A Three-Tier Defence Mechanism for Quality Assurance

Quality Assurance (QA) is a fundamental pillar of public policy and administration. Internal and independent External Quality Assurance (EQA) serve as complementary pillars, providing a structured and robust QA framework and steering accountability and continuous improvement.

Establishing the centralised People & Standards Division (P&SD) further strengthens this framework by introducing an additional layer of oversight designed to safeguard and enhance public service quality. Through initiatives such as the "mystery shopper," Quality Label, and continuous training and development by the Institute of Public Services, the P&SD regularly monitors staff performance and the quality of services rendered, fostering continuous improvement and sustaining high standards.

This three-tier approach to QA – comprising Internal Quality Assurance (IQA), the P&SD, and independent External Quality Assurance (EQA) – ensures a comprehensive approach to reinforcing quality across public administration, promoting sustained excellence in service delivery and effective governance. Public confidence and trust in policy and administration grow when accountability is embedded into daily practices and drives continuous improvement. By strengthening this three-tier QA framework and integrating data-driven intelligence, Malta can enhance policy decision-making, improve service delivery, and build public trust, ensuring governance remains effective, accountable, and responsive to societal needs.

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Driving Public Policy through Data: The Servizz.gov Success Story

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Keywords

Servizz.gov, data-driven decisions, user experience, user research, quality metrics, research and development, service design, public policy

Abstract

Servizz.gov, a public administration agency under the Office of the Prime Minister, is responsible for various functions facilitating government access. These functions include data-driven actions and decisions that guide public policy implementation by providing exceptional customer care and streamlined services aimed at addressing societal issues, fulfilling public needs, and promoting community goals. Such decisions must depend on empirical evidence, statistical data, and thorough analysis rather than merely subjective opinions or assumptions. This article examines how the Agency effectively utilises data in these initiatives. It employs a mixed methodology to evaluate quantitative statistical analysis derived from the digital systems managed by the organisation and explores the qualitative aspects of users' experiences with these services. The article presents recent statistical data and discusses how the Agency is leveraging this data and the measures being implemented to enhance service delivery through data analytics.

Introduction

Servizz.gov is the Government of Malta's one-stop agency providing citizen-centric access to public services in partnership with the departments and governmental entities responsible. It facilitates access through various channels, including the Servizz.gov regional and specialised (Education & Taxpayer) hubs, web portal, a Freephone helpline (153), generic email, live chats, chatbots and social media. The Agency's duties and functions are intended to expedite the provision of government services to users dependably and promptly in collaboration with the relevant entities. The Agency is also tasked to coordinate and facilitate cooperation between these entities in executing service delivery measures or initiatives presented by the Government or the Agency.

In addition, the Agency is progressively extending the accessibility of government services via enhanced or supplementary offerings, convenient access hours, and channels, while augmenting the utilisation of pertinent services that deliver value to users. It is also meant to provide contributions to relevant initiatives, administrative processes, establishment of one-stop shops, service delivery, eGovernment, improvement of call centres, deployment of case management systems, and quality management within the broader public administration (Subsidiary Legislation 595.19, Legislation Malta, 2016). To meet these goals, during 2024, Servizz.gov transitioned to a data-driven approach, utilising the analysed information to enhance the products and service delivery that users need. This approach is essential for the organisation to make informed decisions based on real-time data and effectively deploy resources. The article provides a concise overview of the Agency's introduction in Malta and its similarities with other European nations. The Agency's primary data-driven methodologies are presented in the next section. This is followed by the results obtained by the Agency during 2024, and a discussion on the interpretation of the results leading towards this successful approach.

The article concludes with a summary of the key findings and a perspective on the Agency's plans to further strengthen these approaches in the future.

Context

The public administration has a rich history of providing channels for engagement with the general public. For many years, before the establishment of Servizz.gov, the Maltese government offered these services through various avenues, most notably the Management Efficiency Unit within the Office of the Prime Minister. Among a multitude of other services across government, this entity provided a digital portal through which citizens could communicate with various government entities via a single dedicated online platform to follow up on specific cases. The cases were primarily managed internally by its own staff, and the system directed the cases to the respective departments for processing. As uptake and technology advanced, the public administration recognised the need to establish an agency dedicated to these specific aspects.

Servizz.gov was inaugurated in December 2015 as a strategic initiative by the Government of Malta to centralise and streamline access to public services. The initial phase involved the establishment of three service hubs in Birkirkara, Paola, and Qawra. Within the first three weeks of operation, these centres assisted approximately 3,000 individuals. Over the following years, Servizz.gov expanded its physical presence, culminating in 24 regional hubs across Malta by 2023. These centres recorded 287,580 in-person visits in that year alone. Concurrently, the agency enhanced its digital infrastructure, with the servizz.gov.mt website attracting 898,563 visitors in 2023. Additional digital engagement included 86,192 email inquiries and 61,560 interactions via a chatbot introduced that year. The Freephone 153 service emerged as a vital communication channel, initially handling 2000 monthly calls, leading to a total of over 863,126 calls in 2023. This reflects a significant consistent increase from earlier years; for instance, in 2020, the helpline projected to receive one million calls, up from 650,000 the previous year. By 2025, Servizz.gov has evolved into a cornerstone of Malta's public administration, embracing the principles of accessibility, efficiency, and citizen-centric service delivery. The agency is committed to continuous improvement through its ongoing modernisation efforts, including the integration of artificial intelligence technologies to further enhance user experience.

Other European Member States that have enacted initiatives similar to the local Servizz.gov, each customised to their specific administrative structures and digital contexts, include Estonia, Greece, Albania, and Croatia. These examples illustrate a broader European trend towards integrated, citizen-focused service delivery approaches. The European Commission (2018) analysed the performance of eGovernment within the EU, stating that it was progressing positively. The article reports that at the time, 58% of EU citizens opted to engage with their public administration via online channels, while the overall accessibility of public services online stood at 82%. Digital solutions were anticipated to significantly enhance citizens' trust in governmental institutions. The digital transformation of public administrations was viewed as a guiding principle in the pursuit of a more inclusive, competitive, and citizen-focused Europe (ibid). These digital approaches to public service provision are also complemented by a physical presence in other EU countries besides Malta, such as in France (Interministerial Directorate for Public Transformation, 2025) and in Finland (Digital and Population Data Services Agency, 2025), among others. In light of this, Servizz.gov aligns with this broader vision and continues to expand alongside other European efforts.


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Methodology

The results presented in this article are based on several data sources compiled by the Agency. This primarily consists of data extrapolated from the digitalised systems administered by the Agency and relevant extracts from a recent customer satisfaction survey conducted by the Agency with the general public. The data stemming from the digitalised systems is primarily quantitative and provides an accurate representation of the total number of users served. The analysis of the data resulting from the customer satisfaction survey is based on a statistically significant representative sample conducted through a survey, which offers qualitative empirical data on the users' own experiences with the Agency's services and the public in general during 2024.

The former data set comprises the entire population of customers served by the Agency, whereas the customer satisfaction survey consists of a stratified sample of the general population with a confidence level of 95% and a margin of error of plus or minus 5%. Both data sets presented are the most recent when writing this article and cover operations during 2024.

Servizz.gov commissioned an independent customer satisfaction survey aimed at assessing levels of awareness, contentment, and quality of the customer experience among the general population. The objective of this research was to understand critical domains concerning the Agency's preferred platforms, user experiences, and overall satisfaction perception. This research involved a sample of 500 completed questionnaires from respondents aged 16 and older. Respondents were classified as users if they had utilised the service at any point. A quota based on age and gender was established to ensure a sample accurately representing the demographic profile of Servizz.gov users. The research employed a hybrid methodology, utilising both online and telephone approaches, and implemented CATI (Computer Aided Telephone Interviewing) technology for conducting telephone interviews. A group of skilled and seasoned interviewers conducted these interviews. Online interviews were conducted via the independent service provider's online panel of respondents, which represents the Maltese community demographics.

Results

The results obtained from the ICT systems managed by the Agency indicate that during 2024, there were 2.6 million requests and interactions for public services or information across all platforms between Servizz.gov and its customers. This reflects an increase of 400,000 interactions compared to the activity level of the previous year. The rise in usage was noted across all the platforms provided by Servizz.gov to the public.

The popularity of online public services has surged, with the Servizz.gov.mt website emerging as the most frequented platform, attracting 977,380 visitors. The frequency of visits by these individuals culminated in over 2.9 million page views. During the same timeframe, the Agency received 107,115 emails.

The Servizz.gov freephone 153 has maintained its status as the most popular toll-free number in Malta. In 2024, a total of 1,128,509 calls were made, representing an increase of 265,383 calls compared to the previous year. Between January and December 2024, 332,015 individuals visited the 25 Servizz.gov centres located in various areas.

The Taxpayer Service Hub in Floriana recorded the highest attendance, with 43,600 visitors. The Chatbot and Live chat services catered to over 75,760 distinct users (Servizz.gov 2024, 2025).

The customer satisfaction survey revealed a high public awareness of the Agency, approximately 92%, with around 78% of the population having utilised the Agency's services in the past. Most respondents who did not use the Agency's services indicated that they either did not require the services provided or that another party manages their needs. The analysis also offered insights on how the service could be customised for those who do not currently avail themselves of the services provided. The survey suggests that the population has made use of all the services offered. Most users prefer calling the freephone service at 153, followed by physically visiting the sites and contacting via email. Other users also favour live chat, social media, and the chatbot. The relative percentage of preferences is illustrated in Figure 1

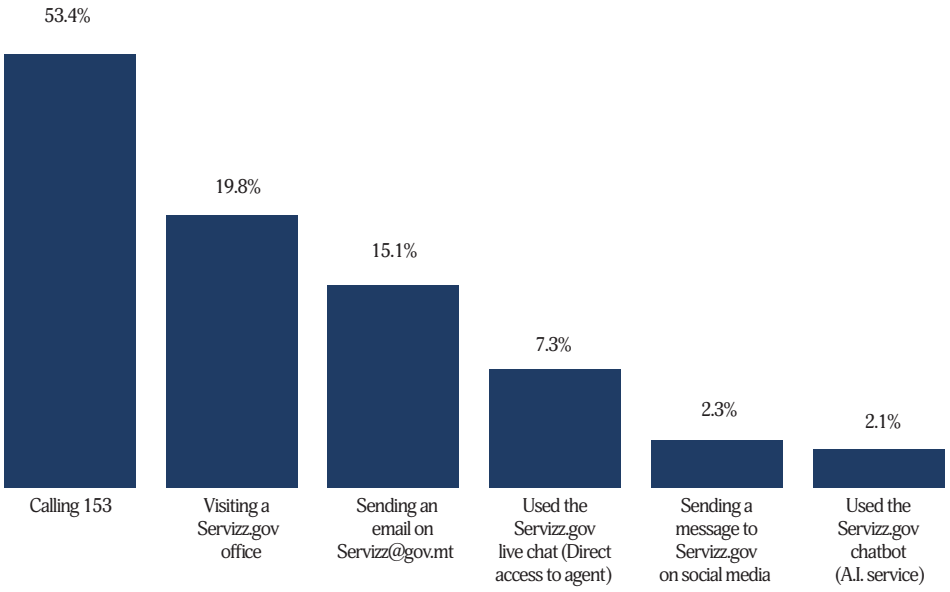


Figure 1: Preferred channels used by respondents of the Customer Satisfaction Survey 2024

The reasons provided by the respondents indicate that this preference is primarily driven by time efficiency, ease of use, the preferred mode of expressing enquiries, convenience, and accessibility. The relative level of user experience with the specific channel, remote accessibility, direct contact, and clear explanations also emerge as important qualitative aspects of users' preferences. Respondents further noted how some channels could be improved by addressing concerns related to traffic and offering more specific answers in certain cases. In other instances, some channels were preferred over others due to the technological considerations of specific demographic groups and the direct human interaction not available through digital channels.

The survey reflects the most widely used offices during 2024. The data can be utilised by the Agency to further analyse whether these trends shift over the coming years due to service provision levels at the respective offices, physical upgrades, and demographic changes.

The customer satisfaction survey indicates that the primary reasons for using Servizz.gov are to request information, submit applications or request services, report problems or raise complaints, and schedule appointments. A relatively smaller group of users also contacts us to make suggestions about government services and other specific departmental enquiries. The underlying reasons for using Servizz.gov are illustrated in Figure 2.

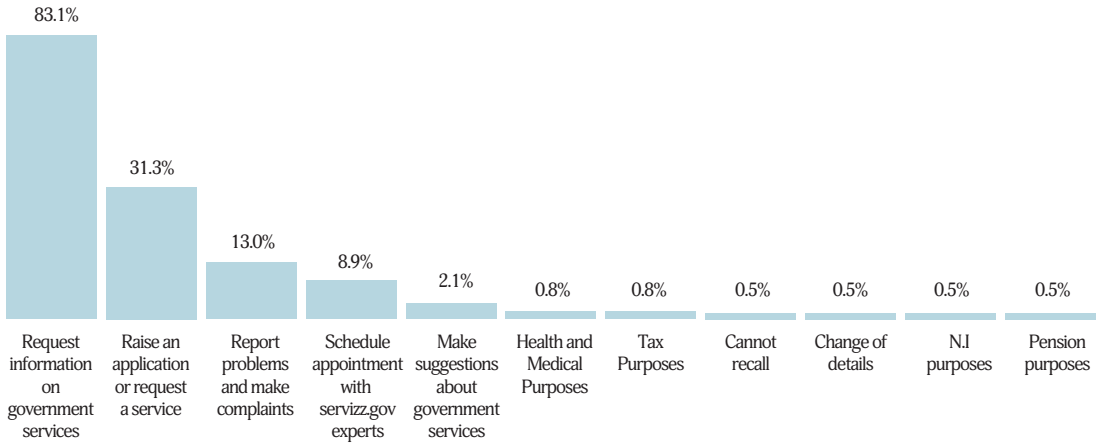


Figure 2: Reasons for using Serizz.gov – Customer Satisfaction Survey 2024

Respondents of the survey were also asked about their experience when using Servizz.gov. The results are indicative that about 84% of respondents agree that the agent or chatbot assisting them was knowledgeable about the queries, 83% agree that connecting time is reasonable, and about 88% agree that Servizz.gov helped them to resolve the issues promptly. Of these, a very high component gave high ratings as indicated in Figure 3.

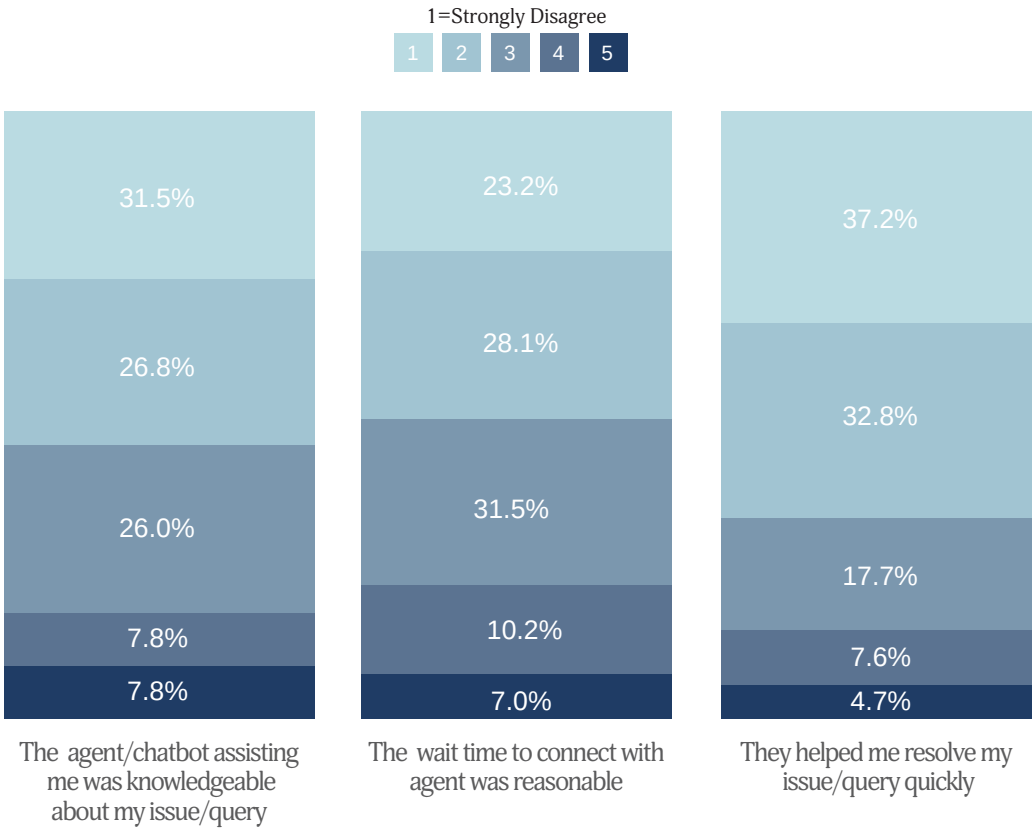
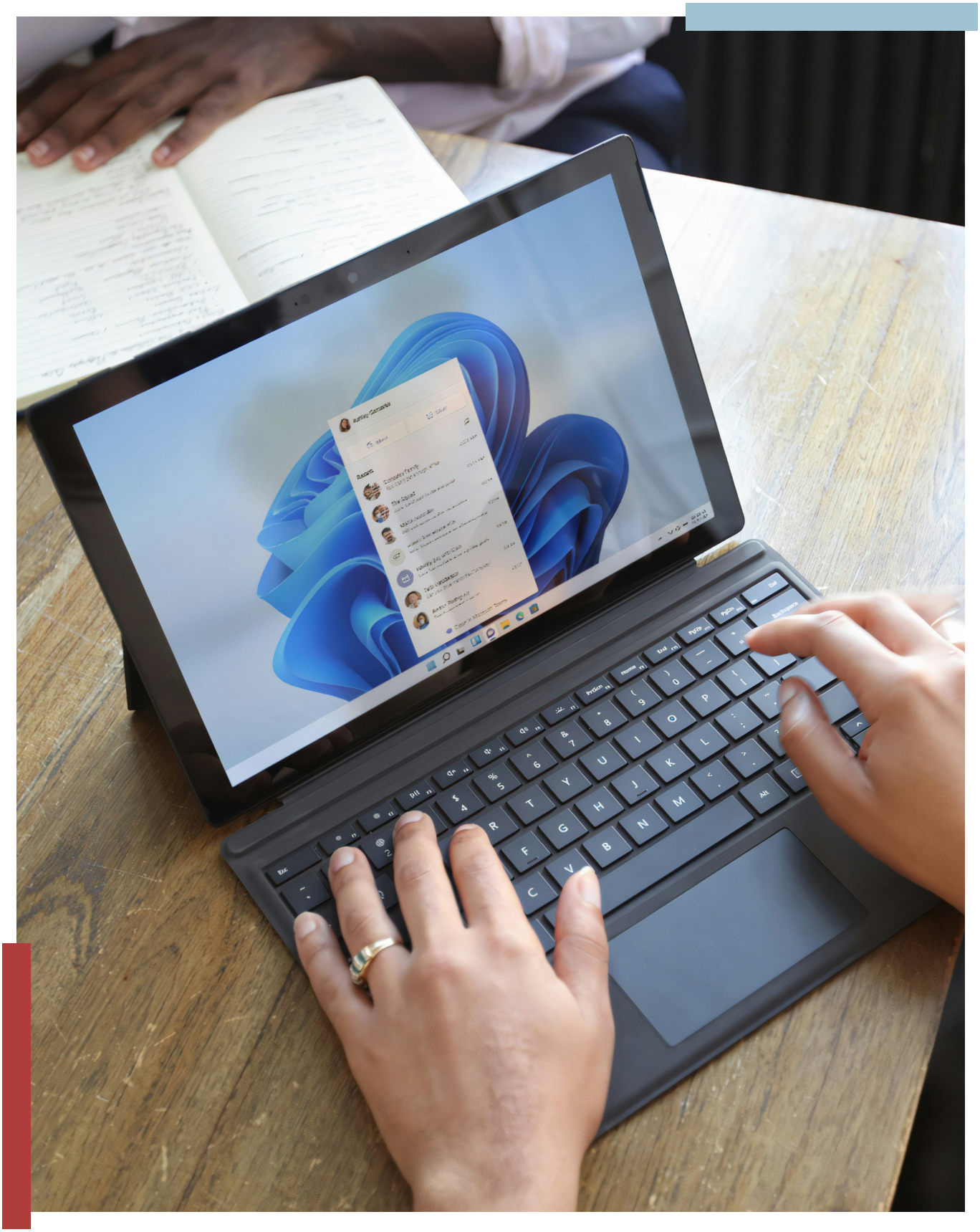


Figure 3: Experience using Serizz.gov – Customer Satisfaction Survey 2024

This resulted in an overall rounded positive mean score rating of 4 out of 5. The customer satisfaction survey was concluded by conducting a Net Prompter Score (NPS) analysis. This is computed by analysing the feedback of the users' experience rating out of 10. Scores of between 0 to 6 are considered as detractors, being essentially representative of disagreement with the level of service provision who are unlikely to be repeat users and may even discourage other users; ratings of 7 and 8 are considered as passive users, meaning that whilst they are satisfied with the service, they are not sufficiently satisfied to be considered promoters; whilst only very high positive ratings of 9 and 10 are considered as positive enthusiastic and loyal prompters of the service provision. The NPS is the net score of the promoters after deducting detractor ratings (Qualtrics, 2025). The report is indicative of a high net positive promoter score, particularly when considering the industry and type of service in which the Agency operates. The qualitative aspect of the Customer Satisfaction Survey is indicative that most users are satisfied, whilst addressing traffic and further training of agents can help to further enhance the level of service provision.



> The Agency continues to invest in new technologies such as a new chatbot with improved AI capabilities replacing an older version.

Discussion

The results presented in this article are not one-off initiatives. They form part of a broader set of strategic initiatives currently being developed by the Agency. Servizz.gov currently operates through 25 hubs spread around Malta to provide an adequately distribution of geographical presence and outreach. The positive results from the data analysis are intended to identify any improvements or fine tune the geographical spread, degree of comfort and service delivery at the physical hubs and the digitalised platforms. The Agency's use of advanced digital tools enhances decision-making by monitoring real-time feedback of the service trends, adapting to demographic preferences, and shaping policy recommendations that are responsive to client needs. Thus, any resulting spikes in user demand which may influence staffing decisions and resource allocation may be factored into the decision-making processes. The digitalised systems are meant to provide a single point of entry and ensuring data integrity. Projects utilising cutting-edge technology will persist in advancing, and thus the Agency needs to be constantly on the outlook on how to optimise the application of artificial intelligence (AI) to execute ambitious initiatives. As a result, during 2024, the Agency adopted a more data-driven approach, utilising information to enhance the product and deliver what the customer wants promptly. This was essential to make informed decisions based on real-time data, enabling the organisation to deploy resources effectively. This is primarily conducted by adapting a data driven approach through the Agency's dedicated recently set up a Research and Development (R&D) department with the intent of improving and innovating the Agency's day to day operations in the long term. This is conducted with the valuable contributions from the Operations and ICT departments of the Agency. The R&D department focus on improving the users experience by conducting customer satisfaction surveys, developing and analysing quality assurance metrics, and improving the service design aspects. It is currently spearheading a three-year strategy for the Agency through the involvement of all departmental heads and staff at all levels.

The total quality management approach being adopted by the R&D Department is intended to enhance user experience. The R&D department in conjunction with the Operations department also conducts a thorough onboarding analysis of new entities to ensure a proper preparatory process which pre-empts challenges and ascertain adequate provisions for both the front-end of the services and identify the requirements of a properly tailored set-up at the back end of the respective governmental departments delivering the services. To this effect, the on-boarding process gathers data from these entities to assess volume and resource requirements by the operations department and the agents, as well as any phasing and marketing requirements. Qualitative metrics are also used to assess improvements against the initial benchmarks to verify improvements

It conducts business evaluations to ensure digital forms align with a proper benchmark of a user experience prior to their launch. The department develops surveys such as the customer satisfaction survey in this article, and employee attitude surveys to recommend potential improvements such as those identified by the users in the result section of this article. The R&D department also assists other entities such as the OHSA and BCA to prepare surveys related to freephone 138. All these tasks collectively contribute towards the compilation and analysis of breath and depth quantitative and qualitative data driven decisions by the Agency. The customer satisfaction survey provided valuable insights on the awareness of the Agency with the general public and their level of usage. It also looked at the preferred communication channels of usage and identifies any barriers for further improvements. The customer satisfaction survey was also formulated by the Agency so that the organisation can gauge customer experience metrics in accordance with established industry standards. The analysis of the quantitative and qualitative data metrics obtained from the survey served to ascertain a benchmark of the current level of service delivery and the degree of customer satisfaction. The qualitative data derived from the survey shall also serve to identify areas which afford potential for further improvement. Data security and integration remain paramount.

The Agency continues to invest in new technologies such as a new chatbot with improved AI capabilities replacing an older version.

This is intended to yield more accurate and context-relevant responses. It is hoped that this approach will result in reduced burden on agents and lead to a better user experience. A new user centric web portal with life-events and personalisation features is underway with the facilities to displaying available citizen data and adapt to individual preferences and needs, integrating recommendations, and providing easily accessible information.

Data analysis is also used for marketing purposes to identify the most popular surveys, and those which need to be afforded better visibility and take-up by conducted tailored marketing campaigns. These initiatives shall be further supplemented with entry and exit interviews at the physical hubs of Servizz.gov, focus groups and the anonymised analysis of the user experience and pain points received from the digitalised services. Data is also collated from agents and hub leaders which directly serve customers. Training shall thus be tailored also for the specific needs and continuous professional development. Pertinent trends from the data are shared with the stakeholders delivering the service in a collaborative effort to improve the service delivery.

Conclusion

The key findings presented in this article indicate that the Agency is utilising data to make informed decisions that support and enhance public policy in alignment with its strategic goals. These findings demonstrate that the Agency's service delivery is successful, with a high level of customer satisfaction. At the same time, data is employed to ensure that corrective and preventive actions are taken to maintain and improve services in the long term. Notably, challenges such as waiting times at the regional and technical hubs are being addressed through the introduction of enhanced features in the new e-ticketing system, enabling more efficient queuing and appointment management. A single point of entry will be implemented to ensure consistency, accuracy, and reliability of information across Government websites. The Agency recommends the establishment of a comprehensive feedback system for Government web forms, allowing citizens to evaluate their experiences at both the application and service delivery stages. To this end, as part of its three-year strategy, the Agency will also embark on developing an appropriate strategic forum aiming to address areas identified for further potential improvement through the involvement of respective stakeholders, departments, and entities. These initiatives will be supported by stakeholder workshops and follow-up sessions to monitor the implementation of recommendations. Moving forward, the Agency will expand its use of user journey analytics, stakeholder workshops, and collaborative feedback loops to establish data as a cornerstone of policy and public service design. Taken together, these measures underscore how data-driven decision-making presents a significant opportunity to enhance the overall user experience and improve the effectiveness of public services.

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Enhancing Administrative Standards of Practice in the Radiology Department

Francesca Mallia

A Critical Review using a Rapid Evidence Assessment of the existing literature related to the Medical Imaging Department at Mater Dei Hospital.

Abstract

This study examines effective standards of practice in administering a radiology department, focusing on the integration of evidence-based decision-making processes. Conducted at Mater Dei Hospital in Malta, this research addresses the lack of localised, peer-reviewed studies that inform administrative protocols in the Medical Imaging Department (MID). By employing a Rapid Evidence Assessment (REA), the study systematically reviews recent literature to identify best practices, challenges, and innovations relevant to radiology administration. The findings highlight critical areas needing improvement, including patient care standards, safety culture, infection control, reporting standardisation, and management of imaging protocols. The research outlines barriers to implementing evidence-based changes, such as resource limitations and resistance from stakeholders, while also emphasising facilitators, such as support from leadership and structured training programmes. This study offers original contributions by adapting international evidence to the Maltese healthcare context, proposing specific recommendations for quality management systems, standardised administrative procedures, and enhanced professional training. It underscores the importance of integrating evidence-based practices into local radiology administration to improve service delivery, enhance patient safety, and boost operational efficiency.

Introduction

Effective management of radiology departments is crucial for maintaining patient safety, operational efficiency, and making informed decisions based on evidence. Nonetheless, the lack of peer-reviewed, in-house research at Mater Dei Hospital's (MDH) Medical Imaging Department (MID) calls for the implementation

of structured methods, such as a Rapid Evidence Assessment (REA), to assess and improve administrative procedures.

According to Abrantes et al. (2019) and McNulty (2023), evidence-based practice forms the backbone of contemporary healthcare, holding the promise of improving patient services and departmental productivity. By incorporating the latest knowledge and evidence into their practices, healthcare professionals can uphold exemplary administrative standards for both patients and staff. This strategy not only reduces the likelihood of errors but also enhances operational efficiency throughout healthcare environments.

By exploring recent research, the initial section of the study aims to elucidate the existing administrative standards, the implementation of protocols, and the challenges faced by radiology departments through the REA. This study provides essential elements and recommendations for assessing and incorporating new evidence into administrative decisions, allowing decision-makers to evaluate the relevance and quality of protocols and policies systematically. Thus, this effort is not just theoretical; it directly impacts the efficiency and quality of patient care and human resources management within the MID administration. Moreover, grasping how research findings apply to the specific context of Mater Dei Hospital is crucial, taking into account factors such as resource availability and patient demographics. Additionally, a key aim is to equip MID leaders with evidence-based insights that facilitate effective administrative decision-making. This includes identifying trends, challenges, and innovations in the administration standards of radiology departments and converting research findings into actionable recommendations for improving SOPs. Through this initiative, the MID aspires to stay at the leading edge of evidence-based administration practices, ensuring optimal patient care that aligns with local circumstances.

The Role of Rapid Evidence Assessment in Radiology Administration

The REA methodology provides a rapid yet comprehensive analysis of existing literature, ensuring that administrative standards are aligned with the latest research findings. In contrast to traditional literature reviews, REA mitigates bias through systematic search techniques and evaluations of methodological quality. Its importance within the realm of public administration is evident, as policymakers require timely and reliable evidence to improve healthcare operations.

Steps in the REA Process

The progressive refinement and narrowing of extensive information into actionable, evidence-based insights were achieved through the following steps, as delineated by Barends et al. (2017):

1. **Background** – Establishing the context and purpose of the review.
2. **Question** – Formulating the main research question.
3. **Inclusion Criteria** – Setting the rules for what studies will be included.
4. **Search Strategy** – Planning how and where to search for evidence.
5. **Study Selection** – Identifying and selecting relevant studies.
6. **Data Extraction** – Collecting key information from the selected studies.
7. **Critical Appraisal** – Assessing the quality and reliability of the studies.

8. **Results** – Presenting findings, organized into:
    - 8.1. **Definitions**
    - 8.2. **Causal Mechanism**
    - 8.3. **Main Findings**
    - 8.4. **Moderators and Mediators**
9. **Synthesis** – Integrating and summarizing the results.
10. **Limitations** – Identifying constraints and weaknesses of the review.
11. **Conclusion** – Summarizing the overall findings and their significance.
12. **Implications for Practice** – Explaining how the findings can be applied practically

The Administrative Standards of Practice found at the MID MDH

In radiology departments, Standards of Practice (SOPs) delineate the competencies mandated for radiologic technologists and medical imaging professionals, ensuring alignment with regulatory requirements and professional guidelines (Young & Smith, 2022). Furthermore, policies and protocols contribute significantly to administrative consistency, facilitating compliance, while protocols provide comprehensive procedural instructions for imaging techniques such as CT, MRI, and ultrasound.

At MID, administrative SOPs are vital for sustaining efficiency and safety. Nevertheless, a principal challenge resides in the deficiency of localised, evidence-based studies to inform and refine these protocols. To address this void, this Rapid Evidence Assessment (REA) was proposed as a structured methodology for reviewing extant literature and integrating the most credible findings into departmental practices (Brettle, 2020).

Conventional protocol development frequently depends on anecdotal evidence or obsolete practices, resulting in inefficiencies and inconsistencies. By adopting an evidence-based approach, MID can synchronise its patient safety, infection control, and reporting standards with international best practices. The implementation of these findings necessitates strategic revisions to current SOPs, continuous staff training, and technological advancements to augment workflow. Policymakers must also address resource limitations and stakeholder resistance to ensure effective adoption. By prioritising evidence-based enhancements, MID has the potential to refine its operational framework, enhance patient care, and position itself as a leader in radiology administration excellence.

Framing the REA Question

A PICOC serves as an essential instrument for reviewers, facilitating the identification of studies pertinent to their

professional context. A PICOC serves as an essential instrument for reviewers, facilitating the identification of studies pertinent to their professional context. Each component of the PICOC framework is vital for refining the focus of the inquiry and enabling a comprehensive and efficient search for the most relevant evidence. By clearly delineating these elements, researchers can more effectively filter studies that are both aligned with the research question and tailored to the distinct characteristics of the organisational environment. This congruence ensures that the findings are not only evidence-based but also practically applicable and implementable within the organisation's specific circumstances (Barends et al,. 2017).

The PICOC Framework

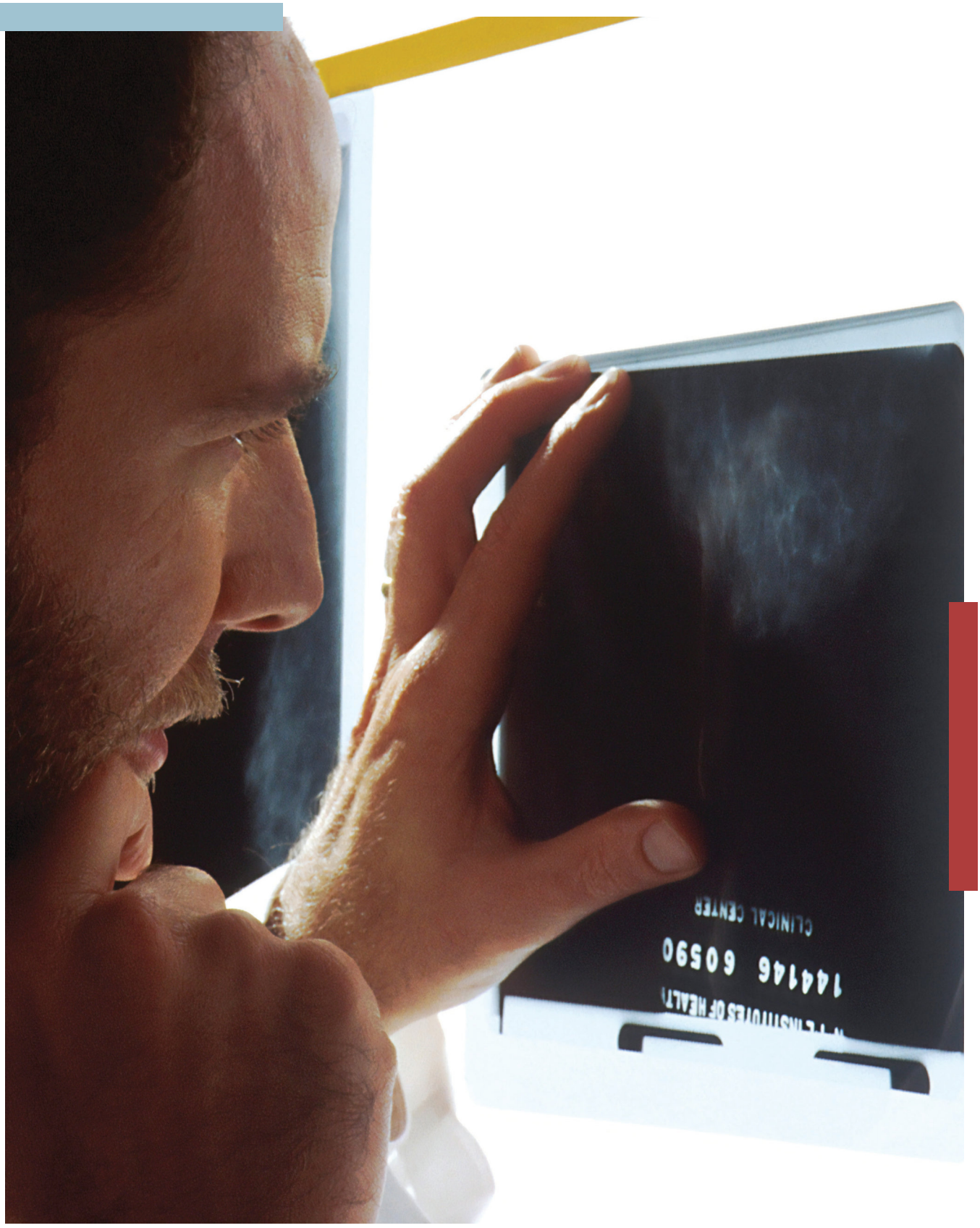
Population	Administrators of radiology departments
Intervention	Evidence based standards of practice
Comparison	Alternative administrative approaches
Outcome	Evidence based recommendations for the administration of Mater Dei Hospital's Medical Imaging Department
Context	Radiology departments

Methodology of the Search Strategy for the REA and Study Selection

A systematic search was undertaken across four principal medical databases: MEDLINE, PubMed, ProQuest, and Scopus, utilising keywords associated with radiology administration, policies, and protocols. Initially, 250 studies were identified. Subsequently, after eliminating duplicates and irrelevant studies, 35 studies were chosen for a comprehensive review. A critical appraisal of the selected studies was conducted, wherein the quality and reliability of each was evaluated based on established trustworthiness levels and methodological rigour. The studies were ranked according to their capacity to support causal relationships between administrative practices and departmental efficiency. High-quality studies were given precedence, while studies with limitations, such as small sample sizes or outdated data, were still considered if they offered valuable insights.

Key Administrative Challenges at MID

The studies identified shared administrative difficulties in areas such as patient care, workflow efficiency, safety culture, infection control, and imaging protocols. This evidence was compiled to create practical recommendations for MID.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Emergency Radiology Services

The demand for emergency imaging services at MDH has increased significantly, necessitating the establishment of streamlined workflows and robust triage mechanisms. Artificial Intelligence (AI) has been proposed to optimise the prioritisation of emergency imaging and minimise diagnostic delays. However, the resistance to the integration of AI, along with concerns related to data privacy and the existing technological infrastructure, impedes progress. The literature indicates that MDH must implement a phased strategy for AI adoption, ensuring it aligns with clinical needs while simultaneously addressing ethical considerations.

Patient Care and Inclusivity

Patient-centred radiology services are essential for the enhancement of healthcare delivery. Nevertheless, research indicates deficiencies in addressing the needs of transgender individuals and the parents of paediatric patients. Complaints regarding miscommunication and insufficient provider training emphasise the necessity for comprehensive sensitivity training. To improve the patient experience, MID should institutionalise structured educational programs that focus on inclusivity, effective communication, and family-centred care models.

Safety Culture and Compliance

Ensuring compliance with safety protocols continues to be a persistent challenge within MID. Although radiation protection guidelines are in place, levels of adherence are often inconsistent, frequently attributable to insufficient training and oversight. Furthermore, cybersecurity threats present substantial risks, particularly in relation to data breaches and system vulnerabilities. Recommended practices include the establishment of standardised radiation safety audits, compulsory cybersecurity training, and the implementation of mechanisms for error reporting to promote a culture of continuous improvement.

Service Quality and Workflow Optimisation

Operational inefficiencies, such as elevated no-show rates and equipment downtime, significantly disrupt service quality at MID. The implementation of predictive analytics and dynamic scheduling models has been proposed to alleviate scheduling inconsistencies. Nonetheless, administrative inertia and resistance to workflow automation hinder effective adoption. It is imperative for MID to prioritise the integration of automated appointment systems and to implement robust equipment maintenance protocols to ensure continuity of service.

Infection Control Measures

The presence of nosocomial pathogens on imaging equipment underscores the necessity for stringent infection control measures. Research studies indicate deficiencies in sanitation protocols and inconsistent compliance with hand hygiene practices among radiographers. Although resource limitations are frequently cited as a justification, the lack

of standardised monitoring frameworks exacerbates the issue. The Management in Diagnostic Imaging (MID) should institute routine infection control audits, enforce adherence to cleaning protocols, and invest in comprehensive staff training to effectively mitigate the risks of infection.

Radiologist Reporting Standards

Inconsistencies in radiology reporting, particularly concerning the standardisation of clinical information, significantly compromise diagnostic accuracy. Although the implementation of structured reporting templates enhances clarity, their adoption continues to be fragmented. Furthermore, variations in the management of second-opinion consultations underscore the necessity for uniform administrative policies. It is recommended that institutions institutionalise structured reporting systems and develop standardised guidelines for external study reviews to ensure consistency in reporting moving forward.

Administration of Imaging Protocols

The hesitance exhibited by radiographers in shifting from experiential learning to evidence-based practice represents a considerable obstacle to the enhancement of imaging protocols. Numerous practitioners persist in utilising antiquated techniques instead of capitalising on modern research findings. In order to address this discrepancy, it is essential for MID to institute obligatory continuous professional development (CPD) programs, which focus on evidence-based imaging practices and quality assurance measures.

MID Document Review and Comparison

Numerous Standard Operating Procedures (SOPs) at the Medical Imaging Department (MID) are founded on historical practices rather than contemporary research. This reliance has resulted in inconsistencies in patient management, safety protocols, and reporting standards. For instance, while some emergency radiology workflows are distinctly articulated, they lack the integration of technological advancements, such as artificial intelligence-assisted triage systems that have the potential to enhance efficiency. Moreover, patient care protocols display opportunities for improvement, particularly in domains related to communication and inclusivity.

Research from the Radiology Education Association (REA) underscores the significance of tailored communication strategies for diverse patient populations, which include transgender individuals and parents of paediatric patients. Nevertheless, the existing policies at MID do not adequately accommodate these requirements, indicating a necessity for targeted training programs aimed at enhancing patient interactions.

Regarding safety culture, MID has instituted policies concerning radiation protection and risk management; however, adherence to these policies appears inconsistent. The REA advocates for structured reporting systems and standardized safety checklists as critical components in improving patient safety and ensuring staff compliance with protocols. Additionally, cybersecurity risks have been identified at MID, suggesting the need for more robust data protection measures to avert potential breaches within radiology information systems.

A further pressing concern pertains to service quality and workflow management. Challenges such as elevated no- show rates, inefficient patient scheduling, and equipment downtime adversely impact overall departmental efficiency. The REA proposes solutions, including predictive analytics and automated scheduling systems, to optimize workflow; however, MID has yet to incorporate these tools into its daily operations. Infection control practices at MID adhere to fundamental hygiene protocols, yet studies from the REA reveal deficiencies in compliance and monitoring. Implementing a more systematic audit process, alongside updated disinfection protocols and enhanced staff training, would significantly bolster infection prevention measures.

Concerns regarding radiologist reporting standards were noted as an area requiring attention. The findings from the REA underscore the advantages of utilising structured reporting templates to ensure both consistency and clarity within radiology reports. Nevertheless, MID persists in employing a combination of structured and free-text reporting methods, resulting in inconsistencies in report quality. The standardisation of reporting practices has the potential to enhance both diagnostic accuracy and efficiency. Furthermore, an assessment of imaging protocols revealed a discrepancy between evidence-based practices and the current administrative decisions implemented at MID. A significant number of radiographers continue to depend on experience-based techniques rather than adhering to research-driven protocols, which may adversely affect imaging quality and patient outcomes. Ongoing training and strict compliance with clinical imaging guidelines would serve to mitigate this disparity.

In conclusion, the review of documents indicates that while MID possesses formal policies, a considerable number of these policies are outdated or applied inconsistently. By integrating recommendations supported by research, strengthening training initiatives, and utilising technological advancements, MID can enhance administrative efficiency, patient care, and the overall quality of service in the radiology department.

Recommendations

This section will outline six recommendations for policy reforms at the Maltese Institute of Digital Health (MID) derived from the findings.

1. Establishing an In-House Research Unit

MID must invest in in-house research initiatives to mitigate reliance on external literature. A dedicated research unit can conduct localised studies, evaluate administrative policies, and customise best practices to fit the Maltese healthcare context.

2. Implementing Artificial Intelligence

A structured framework for adopting Artificial Intelligence, encompassing pilot programs and stakeholder consultations, will facilitate smoother integration. AI applications should be aligned with clinical workflows, ensuring that radiologists and administrative personnel receive adequate training.

3. Enhancing Training

Mandatory sensitivity training, cybersecurity awareness programs, and continuous professional development (CPD) initiatives will equip MID personnel with essential skills to adapt to the evolving challenges in the healthcare sector. Training programs must undergo periodic evaluations to assess their impact on service quality.

4. Standardising Reporting

Uniformity in radiology reporting and administrative protocols will improve efficiency and diagnostic accuracy. MID should develop standardised templates, establish centralised reporting guidelines, and enforce compliance through regular audits.

5. Strengthening Infection Control Measures

Routine sanitation audits, stricter compliance monitoring, and investments in high-quality disinfectants are necessary to mitigate infection risks. Furthermore, structured Infection Prevention and Control (IPC) training sessions should be mandatory for all radiology staff.

6. Leveraging Automation for Workflow Optimisation

The incorporation of automated scheduling systems, predictive analytics, and maintenance tracking tools will significantly enhance operational efficiency. It is imperative that administrative personnel receive the requisite training to adeptly navigate these technological advancements.

Conclusion

The findings of this study elucidate significant deficiencies within the administrative framework of the Medical Imaging Department (MID) at the Medical and Diagnostic Hospital (MDH), thereby necessitating targeted policy interventions. Although the Rapid Evaluation Assessment (REA) offers a robust foundation for evidence-based decision-making, its limitations emphasise the necessity for localized research. Furthermore, recognising constraints such as limited resources, resistance to change, and the variability of international best practices may impact the viability of executing all proposed enhancements within the MID. Nevertheless, by addressing administrative inefficiencies, embracing technological advancements, and cultivating a culture of continuous improvement, the MID can augment radiology service delivery and maintain the highest standards of patient care.

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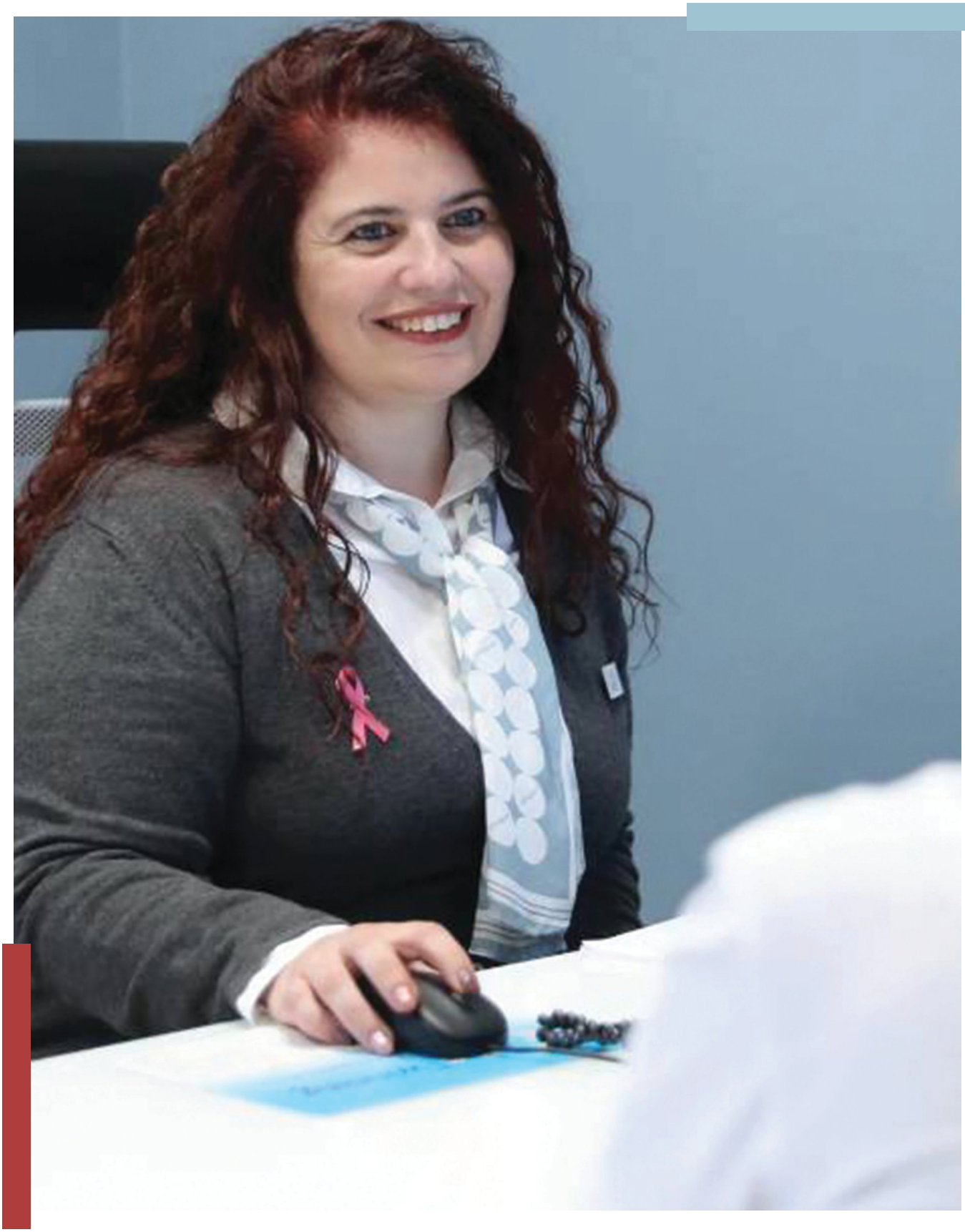


The Future of Triage in Emergency Care: Findings from a Cognitive Task Analysis Study

Steve Agius

Abstract

Triage in Emergency Departments is a complex, high-stakes process that relies heavily on rapid decision-making under conditions of uncertainty, time pressure, and information gaps. This paper explores how digital technologies, particularly data-driven Clinical Decision Support Systems (CDSS), can augment triage decision-making to improve patient safety, operational efficiency, and clinical outcomes. Using Cognitive Task Analysis (CTA), the study examines the cognitive demands faced by triage nurses, the strategies they employ, potential sources of error, and design recommendations for future CDSS. Findings are organised into a cognitive demands table, identifying key areas where digital support can enhance clinical practice, such as automated priority suggestions, predictive resource allocation, real-time translation tools, and pattern recognition systems. The paper envisions a future where intelligent, adaptive CDSS integrated with real-time patient data, wearable technologies, and predictive analytics transform triage from a reactive to a proactive system. This paper also highlights critical considerations, including the risk of deskilling, biases, and trust in data-driven recommendations. Ultimately, the future of triage resides in systems developed from the ground up with direct input from triage nurses, thereby ensuring that technological innovations genuinely align with clinical realities. These systems should aspire to augment, rather than supplant, human expertise, thereby fostering a patient-centred, anticipatory, and resilient emergency care environment.

Introduction

The Emergency Department (ED) stands at the frontline of healthcare, managing a vast and unpredictable spectrum of patient needs (Rowe and Knox 2023). Triage, the process of determining the priority of patients' treatments based on the severity of their condition, is critical to ensuring timely and appropriate care (Gorick 2022). Traditionally, triage relies heavily on the clinical expertise, intuition, and judgment of healthcare professionals, particularly nurses, operating under intense time pressures and often with incomplete information (Gorick 2022; Reay and Rankin 2013). However, as EDs worldwide face increasing patient volumes, rising complexity of clinical presentations, and ongoing resource constraints, there is a growing recognition of the limitations inherent in purely human-driven triage processes (Rowe and Knox 2023).

Advances in digital health technologies, particularly Clinical Decision Support Systems (CDSS), offer new opportunities to enhance triage decision-making. These technologies aim to support healthcare professionals by providing data-driven insights, mitigating cognitive biases, and improving consistency and accuracy in patient assessment and prioritisation (Chen et al. 2023; Hak, Guimaraes, and Santos 2022). Yet, to design effective CDSS for emergency care, it is essential to first understand the cognitive processes that underpin triage decisions, the challenges, strategies, and information cues that shape them (Camacho et al. 2020).

This paper draws on Cognitive Task Analysis (CTA) to explore the real-world cognitive demands faced by triage nurses and to identify opportunities where digital tools can better support their decision-making. By unpacking these processes, the study aims to inform the design of future intelligent triage systems that align with clinical workflows, enhance patient safety, and anticipate the evolving needs of emergency medicine.

Background

The ED plays a crucial role in providing urgent medical care, with triage serving as a pivotal process for delivering immediate medical attention to patients with acute illnesses, ensuring efficient patient flow and quality care (Kovacs and Croskerry 1999). Triage decision-making is essential for prioritising patient care and interventions, often occurring rapidly and autonomously within time constraints (Clifford-Brown, Challen, and Ryan 2010). Nurses rely on intuition, clinical experience, and cognitive processes to make informed judgments (Levis-Elmelech, Schwartz, and Bitan 2022). Intuition complemented by clinical experience facilitates rapid identification of critical cases and enhances pattern recognition while cognitive factors aid in efficiently processing and prioritising patient information (Stanfield 2015). These elements play an important role in the triage environment where physical, social, and situational factors influence decision-making dynamics, highlighting the complex interplay between individual skills and contextual factors (Bijani and Khaleghi 2019). This ultimately leads to inherent uncertainty which is characterised by incomplete and conflicting information and unpredictable outcomes (Scott et al. 2023). Inadequately managed uncertainty can lead to medical errors, inappropriate treatments, and increased morbidity and possibly mortality amongst patients (Bhise et al. 2017).

Medical errors often stem from human errors, which account for a considerable proportion of preventable incidents (Sameera, Bindra, and Rath 2021) and are a leading cause of decision failures (Mohamad, Aliandrina, and Feng 2005). Human errors encompass a broad range of mistakes made by individuals, including errors in judgment, communication, or execution of tasks. Common causes of medical errors include diagnostic errors, incorrect tests or treatments, or failure to follow established protocols for diagnosis (Piryani 2015). More than two decades ago, the Institute of Medicine published a comprehensive report in which 44,000 to 98,000 deaths per year in hospitals based in the United States were attributed to medical error. A more recent review of patient charts indicates that 4% to 17% of hospital admissions were related to adverse medical events, of which roughly two-thirds were preventable (Rafter et al. 2015). These percentages are only a rough approximation and probably underestimate the problem in view that errors in healthcare are not recorded properly (Motamed and Sharifi 2017). EDs experience a higher rate of medical errors, estimated to be around 10 to 15% more than the recorded adverse events for routine hospital in-patients (Hussain et al. 2019). These medical errors, influenced by cognitive biases, communication breakdowns, procedural deviations, as well as the impact of fatigue and stress, can significantly contribute to adverse medical events and compromise patient safety (McDonald et al. 2013). Cognitive biases, like anchoring and confirmation bias, arise from constraints in the thinking process. Moreover, communication breakdowns hinder accurate assessments and treatment plans while deviations from established protocols can lead to errors in medical procedures (Hartigan et al. 2020) .

Clinical Decision Support Systems (CDSS) have emerged as a promising tool to enhance decision-making efficiency and reduce errors (Muhiyaddin et al. 2020; Shahsavarani et al. 2015). These systems leverage technology to provide evidence-based recommendations, thereby supporting clinicians in complex scenarios and contributing to improved clinical outcomes (Jones, Thornton, and Wyatt 2021).

However, designing effective CDSS requires a deep understanding of the cognitive processes that underpin triage decisions, including the sequencing of tasks, the role of prior experience, individual and organisational constraints, and contextual pressures (Graham et al. 2023). Yet, methods for systematically exploring these cognitive processes remain underdeveloped in healthcare literature (Roosan et al. 2016; Zikos and DeLellis 2018).

Cognitive Task Analysis (CTA) offers a structured method for unpacking these cognitive processes, particularly in high-pressure environments such as EDs. Rooted in naturalistic decision-making theory, CTA focuses on eliciting the tacit knowledge held by experts, knowledge that is often difficult to articulate yet essential for effective practice (Graham et al. 2023; Kahneman and Klein 2009). When CTA is used to inform system design, CDSS can become more intuitive, human-centred, and aligned with the realities of emergency care environments, leading to higher rates of user acceptance, system adoption, and successful implementation (Piotrowski et al. 2023; Smith et al. 2020; Varonen et al. 2008).

Despite the critical need for such methods, CTA remains underutilised in emergency medicine research (Swaby et al. 2022). To address this gap, this study employs CTA to systematically examine triage decision-making in the ED, aiming to support the development of next-generation decision support tools that better match clinical cognitive workflows.

Methodology

CTA was chosen for its ability to capture and structure the tacit knowledge and cognitive strategies that expert practitioners use when making complex decisions under uncertainty and time constraints. The model was trained on six years (2017–2022) of ED data from Mater Dei Hospital, encompassing 32 million data points. The model demonstrated high accuracy at the very early stages of triage, with a patient prioritisation accuracy of 76%, admission prediction accuracy of 82%, and 86% accuracy in predicting the admitting ward.
This research, underpinned by data-driven predictive models, has the potential to enhance the reliability of patient classification and significantly impact resource allocation and operational efficiency within emergency care settings.
Data collection consisted of two primary methods:

1. **Interviews:**

A total of 16 in-depth interviews were conducted, each lasting between 30 and 45 minutes. The interviews aimed to elicit information about the cognitive demands, cues and factors influencing decision-making, strategies used to manage complexity, and perceived sources of error during triage.

2. **Observations:**

In addition, 6 hours of observation time which amounted to 55 triage patient sessions were undertaken across multiple shifts, including both peak and non-peak periods. Observations focused on real-time triage decision-making, patterns of information gathering, handling of uncertainty, communication dynamics, and environmental influences.

All interviews were audio-recorded and transcribed verbatim. Field notes from the observational sessions were systematically compiled immediately after each session to capture contextual factors and decision-making behaviours.

Results

Thematic analysis of the interviews and observations revealed several recurring patterns and challenges within the triage process. Nurses frequently reported experiencing significant time pressures during busy periods, describing the triage environment as overwhelming when patient queues became long. Incomplete information during patient assessments, particularly in cases involving elderly, unconscious, or non-communicative patients, was commonly identified as a major challenge.

Many nurses described relying on visual cues and clinical intuition often referred to as “gut feeling” to support decision-making when information was limited. Deviations from standard triage protocols were also noted, particularly when nurses prioritised patients whose presenting complaints indicated potentially serious conditions, even when formal registration information was incomplete.

Communication barriers, particularly when patients spoke a language not understood by the triage nurse, were a frequent source of difficulty. These barriers often necessitated the use of informal interpreters, non-verbal communication strategies, or mobile translation applications, potentially increasing the risk of miscommunication and delays in patient assessment. Multitasking behaviours were a characteristic feature of the triage process, with nurses frequently engaging in patient interviewing, IT system navigation, and documentation simultaneously.

While adherence to the Emergency Severity Index (ESI) triage tool remained high, nurses acknowledged occasionally applying clinical judgment beyond algorithmic outputs to respond to contextual factors. Immediate escalation to senior staff or physicians was observed in several cases, particularly when rapid deterioration or significant communication barriers arose.

To provide a more detailed analysis, these findings were synthesised into a Cognitive Demands Table, categorising the cognitive demands, challenges, information cues, coping strategies, sources of error, and design ideas identified during the study. This framework informs the design of more intuitive, human-centred CDSS tailored to the realities of emergency care.

Cognitive Demand	Why difficult	Cues/Factors/Information
Patient Assessment in Triage	Balancing efficiency with accuracy in a very limited time-window.	Extended waiting times for patients in the ED.
Strategies	**Potential Errors**	**Design ideas for an effective CDSS**
Prioritise cases based on severity	Rushed assessments leading to inaccurate prioritisation. Overlooking critical details due to time constraints. Increased risk of misclassification of patient severity. Inconsistent application of the triage protocol.	Implement an automated priority suggestion system.
Cognitive Demand	**Why difficult**	**Cues/Factors/Information**
Patient Assessment during peak hours	Patient influx during peak hours.	Time-sensitive nature of emergency care.
Strategies	**Potential Errors**	**Design ideas for an effective CDSS**
Allocate resources based on anticipated patient volume.	Delayed response to critical cases. Inefficient allocation of resources leading to bottlenecks.	Utilise predictive analytics to anticipate and manage peak hours and a resource allocation algorithm in the system. Include a real-time patient flow dashboard in the CDSS.
Cognitive Demand	**Why difficult**	**Cues/Factors/Information**
Data Collection for Assessments	Promptly gathering pertinent information to inform critical decisions.	Limited time window for triage assessments.
Strategies	**Potential Errors**	**Design ideas for an effective CDSS**
Develop a structured template for quick data collection.	Risk of incomplete or insufficient data collection due to time constraints during triage assessments.	Implement voice-to-text features for rapid verbal data entry.

Cognitive Demand	Why difficult	Cues/Factors/Information
Observation Cues and Patterns	Rapid interpretation of subtle cues; modification of triage levels.	Non-verbal cues (body language, facial expressions, vital signs).
Strategies	**Potential Errors**	**Design ideas for an effective CDSS**
Ongoing training in pattern recognition and triage modification.	Risk of errors in the interpretation of subtle non-verbal cues, such as body language, facial expressions, and vital signs. Challenges in modifying triage levels based on observed cues, leading to potential inconsistencies or misjudgements	Include a data-driven component in the CDSS for pattern recognition and decision support and algorithm for automated analysis of non-verbal cues.
Cognitive Demand	**Why difficult**	**Cues/Factors/Information**
Uncertainty, Incomplete Information, and Communication Barriers	Finding innovative ways to address communication barriers, such as using interpreters or mobile translation tools.	Language differences, cultural barriers, or hearing impairments.
Strategies	**Potential Errors**	**Design ideas for an effective CDSS**
Implement a system to document language barriers	Risks of overlooking or misinterpreting critical information due to language differences, cultural barriers, or hearing impairments. Challenges in effectively addressing communication barriers, leading to potential misunderstandings in patient information. Potential errors in decision-making arising from incomplete information or misunderstandings.	Implement a real-time translation tool within the CDSS.
Cognitive Demand	**Why difficult**	**Cues/Factors/Information**
Deviations from triage	Balancing the need for deviations with adherence to evidence-based protocols and the triage process	Balancing deviation with adherence to evidence-based protocols..

Strategies	Potential Errors	Design ideas for an effective CDSS
Encourage collaboration and communication among triage nurses for consensus on deviations.	Difficulty in balancing the need for deviations with adherence to evidence-based protocols and the standard triage process. Risk of inconsistent decision-making when determining the appropriate level of deviation.	Implement voice-to-text features for rapid verbal data entry.
Cognitive Demand	**Why difficult**	**Cues/Factors/Information**
Seeking advice during triage	Seeking external opinions from lead nurses, colleagues, and lead doctors to enhance decision-making.	Recognition of the need for external opinions.
Strategies	**Potential Errors**	**Design ideas for an effective CDSS**
Encourage regular collaboration and feedback sessions.	Overreliance on external opinions leading to delayed decision-making. Lack of established channels for effective communication with lead nurses, colleagues, and lead doctors. Inconsistent collaboration practices among triage nurses.	Implement a real-time translation tool within the CDSS.
Cognitive Demand	**Why difficult**	**Cues/Factors/Information**
Long Shifts	Extended shifts impact empathetic response.	Fatigue, stress, burnout
Strategies	**Potential Errors**	**Design ideas for an effective CDSS**
Implement rest breaks, stress management programs	Reduced patience, attentiveness.	Nudges, fatigue-monitoring technology, such as wearable devices that track nurses' activity levels and provide alerts for breaks.

Discussion

Digital triage in emergency medicine is evolving to address current challenges by leveraging advanced data technologies to support clinical decision-making, streamline workflows, and enhance patient safety. Traditional triage methods, while effective, are often constrained by human cognitive load, variability in clinical judgment, and resource constraints (Farrohknia et al. 2011). They may also struggle to adapt quickly to sudden surges in patient volume or emerging clinical patterns, limiting their responsiveness in dynamic emergency environments (Bernstein et al. 2009; Farrohknia et al. 2011).

One of the primary concerns in triage is balancing efficiency with accuracy, particularly under time constraints and during peak hours.

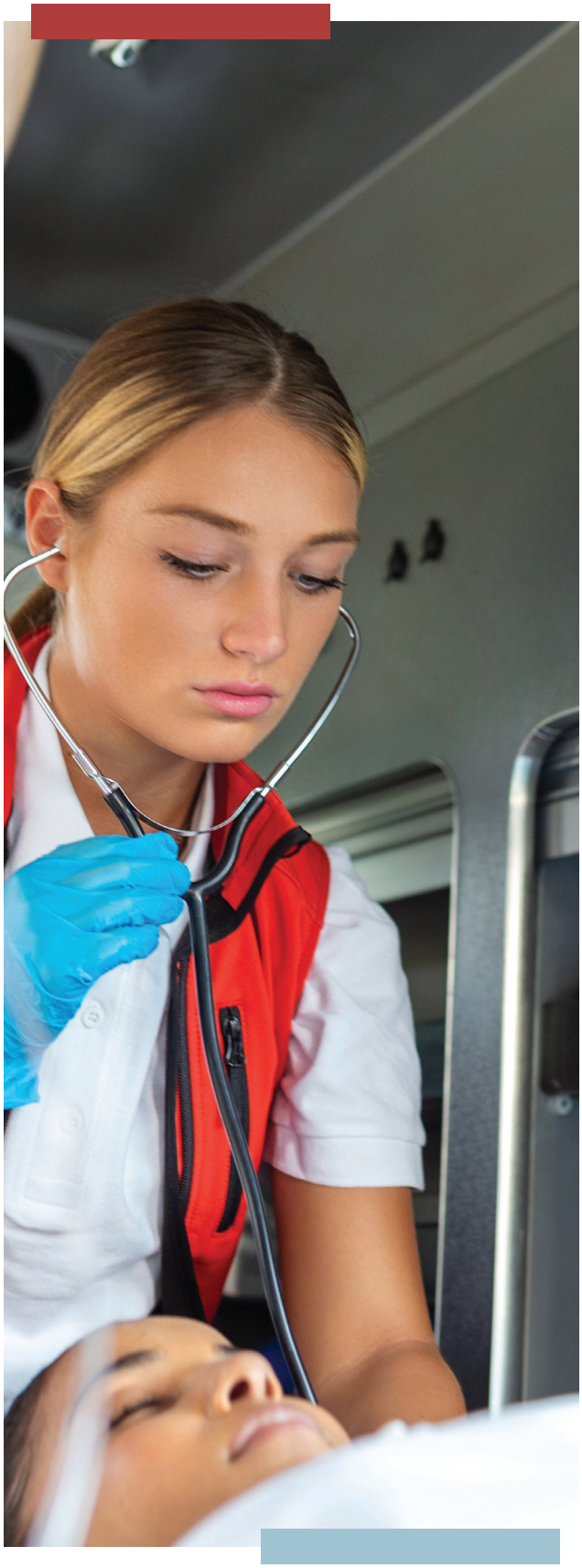
Implementing automated priority suggestion systems enabled by data-driven algorithms can support triage nurses in making rapid yet reliable decisions, reducing the risk of misclassification and inconsistent protocol application. Additionally, predictive analytics and real-time patient flow dashboards can aid in resource allocation, ensuring that critical cases are identified and managed efficiently even during high patient influx periods.

Data collection during triage remains a key factor in effective triage decision-making, yet the limited time available often results in incomplete or insufficient data. Voice-to-text technology can facilitate faster and more structured documentation, minimising information gaps. Furthermore, integrating data-driven pattern recognition into CDSS can enhance the interpretation of non-verbal cues such as facial expressions and vital signs, improving the accuracy of triage decisions. These advancements reduce reliance on subjective assessments and introduce a more standardised approach to patient evaluation.

Communication barriers between triage nurses and patients, including language differences and cultural factors, present another challenge in emergency triage settings. To overcome these barriers, future digital triage systems should incorporate real-time medical translation tools within CDSS, enabling seamless communication between healthcare providers and patients. For example, they could translate spoken symptoms into the clinician's language, support multilingual digital symptom checkers, or display visual aids to help patients describe pain or discomfort.

Deviations from standard triage protocols are sometimes necessary, yet they introduce the risk of inconsistent decision-making. Digital triage can support structured deviation management through integrated training modules that guide nurses on when and how deviations should be applied. Collaborative decision-making tools can further enhance triage accuracy by facilitating real-time consultations among healthcare professionals. In addition, structured self-assessment features within CDSS can encourage reflective practice, prompting triage nurses to evaluate their decisions and refine their judgment over time.

Coordination among healthcare professionals is crucial in emergency medicine, but traditional communication methods, such as pagers, can lead to delays and miscommunication. Future digital triage systems should replace outdated methods with real-time communication tools that enable seamless information exchange among triage nurses, clinicians, and other healthcare professionals. Establishing standardised communication protocols within these systems will further streamline coordination, ensuring that critical decisions are communicated clearly, consistently, and without delay



Finally, cognitive overload and fatigue among triage nurses can impact decision-making and patient outcomes. Extended shifts and the high-stress nature of emergency medicine contribute to burnout, reducing attentiveness and empathetic response. Digital interventions such as fatigue-monitoring technology can help mitigate these effects by providing alerts for rest breaks based on real-time activity tracking. Additionally, data-driven workload balancing can distribute cases more efficiently, preventing excessive strain on individual healthcare providers.

Conclusion: The Future of Triage

As intelligent triage systems continue to tackle current operational and clinical challenges, their evolution also paves the way for reimagining what triage could entail in the future. The integration of data-driven technology not only enhances present-day performance but also establishes a foundation for more adaptive, intelligent, and anticipatory systems. These technological underpinnings, rooted in predictive analytics, natural language processing in decision-making, real-time data integration, and collaborative decision-making, signal a paradigm shift in how EDs manage overcrowding, complexity, uncertainty, and clinical urgency.

In the coming decades, emergency triage could be transformed by adaptive, self-learning CDSS that seamlessly integrate with real-time patient data. These systems may not only enhance clinical decision-making but also anticipate patient deterioration before symptoms escalate, utilising an interconnected ecosystem of wearable sensors, remote monitoring networks, and predictive analytics. Continuous streams of biometric data, including heart rate variability, oxygen saturation, stress biomarkers, and even early sepsis indicators, could enable proactive triage, dynamically prioritising cases based on real-time physiological trends rather than static assessments.

The future may also see ambulance-based data-driven systems acting as mobile triage hubs, pre-processing patient information en route and autonomously coordinating with hospital networks. Emergency departments could shift from reactive to pre-emptive resource allocation, with dynamic bed assignments, automated supply chain management, and data-driven staffing recommendations that respond to patient influx patterns. Real-time integration with electronic health records could allow clinical decision support systems to cross-reference incoming cases with genetic predispositions, pharmacogenomic data, and previous clinical encounters, fostering a personalised triage experience.

In addition to operational enhancements, the interface between human cognition and data may also develop. Next-generation triage could incorporate immersive mixed reality (MR) or augmented reality (AR) overlays, offering decision-makers real-time risk assessments, visualisation of critical vitals, and even data-driven diagnostic suggestions. Interactive kiosks and data-powered tele-triage systems could further decentralise emergency care, triaging patients remotely before they even reach the ED, thus reducing bottlenecks and ensuring the prioritisation of high-risk cases.

Yet these advancements also raise profound questions. Will such systems enhance clinical intuition, or will they risk deskilling healthcare professionals and fostering over-reliance on data-generated recommendations? How will triage frameworks balance algorithmic efficiency with the empathetic elements of human judgement? Just as importantly, how can trust be built and sustained among healthcare professionals, patients, and institutions in the use of these technologies, particularly when decisions carry high stakes? Could these data technologies introduce new forms of bias, intentionally or unintentionally disadvantaging certain patient groups if not carefully designed and monitored? The ethical, legal, operational, and trust-related implications of fully integrated, data-driven triage remain critical areas for future discourse.

Ultimately, the vision for triage is not one of automation, replacing human expertise, but rather one of augmentation, where data-driven insights, real-time information, and human clinical acumen converge to create an emergency care environment that is anticipatory, empathetic, patient-centred, and resilient in the face of emerging healthcare challenges. As this transformation unfolds, the conversation must remain dynamic, ensuring that technological advancements align with the values, competencies, and limitations of the human users at the core of the triage process.

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The Utilisation of Sources of Evidence in the Maltese Public Service: Examining Demographic Factors and Influence on Vigilant Decision-Making

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Keywords

evidence-based management, vigilant decision-making, public service, sources of evidence, Malta

Abstract

This empirical study examined the extent to which Maltese public service employees utilise different sources of evidence when making important decisions. Using a census-based sample, 185 employees (scales 2–7) completed an online self-administered questionnaire. Results showed frequent use of organisational data, practitioner expertise, and stakeholder input, but limited use of scientific literature findings. Utilisation varied with education level and significantly predicted vigilant decision-making. The study recommends that the Institute for the Public Service makes scientific research more accessible and relevant to public servants and to promote systematic evidence use to support thoughtful, vigilant decisions.

Introduction

Evidence-Based Management (EBM) is a structured decision-making approach that replaces intuition with credible source of evidence. Barends and Rousseau (2018) define it as the conscientious use (critical thinking) of the best available evidence. The four sources of evidence in EBM are scientific literature, organisational data, professional expertise and stakeholder influence. In public service management, EBM enhances decision-making processes by ensuring transparency, accountability, and effectiveness—three of the five core principles outlined in the Public Service Reform Review (Bezzina et al., 2021).

The aim of this article is to determine the extent to which public service employees utilise the four sources of evidence and whether this varies as a function of demographic variables (gender, age, leadership status, and level of education). This study will also examine whether evidence source utilisation can predict vigilant decision-making after controlling for these demographic variables. The study will conclude by presenting a thorough discussion of the findings, their limitations and their implications for practice within the Maltese Public Service.

Literature Review

While no decision is ever entirely free from uncertainty, EBM provides a structured and disciplined approach to making informed, strategic choices. Building on this foundation, Barends et al. (2018) highlight how EBM enables managers to critically assess the quality and relevance of evidence before applying it to develop effective solutions. This process involves identifying the problem, gathering and evaluating evidence, synthesising insights, applying findings, and reviewing outcomes. Briner (2024) complements this by outlining three guiding principles for effective EBM: framing the right question, sourcing evidence from multiple channels, and critically appraising its reliability and relevance before making a decision.

Such integration supports the public service aims in its efforts to ensure value for money, improve service quality, and increase government efficiency by promoting cost-effectiveness, aligning service standards with those of the private sector, and optimising overall performance (Bezzina et al., 2017).

The first source of evidence in EBM is scientific literature. This type of evidence offers a foundation for understanding theories, patterns, and observations in a systematic way (Simon, 1996). However, engaging with scientific literature requires a tolerance for complexity and uncertainty, as Howell and Brossard (2021) point out. Sinatra et al. (2014) further explain that many people wrongly assume that unless a theory is completely certain, it lacks validity—an expectation that can lead to mistrust or rejection of research findings. Similarly, Rabinovich and Morton (2012) argue that such misconceptions can discourage people from seeking or trusting scientific evidence. Despite this, scientific literature equips managers with the critical knowledge needed to navigate uncertainty and evaluate whether their decisions are evidence-based. As Dawes (2001) notes, while personal assumptions inevitably shape our perspectives, scientific research serves as a reliable tool to challenge and refine those views.

The second source of evidence is organisational data. Barends and Rousseau (2018) differentiate between (1) hard facts or numbers, which take the form of statistical figures such as audit reports, and (2) soft data, which includes elements related to organisational culture, such as performance appraisal interviews.

Organisations gain a competitive edge by replacing assumptions with facts and validating traditional beliefs with data (Pfeffer & Sutton, 2006).

Furthermore, Barends and Rousseau (2018) focus more on the process and outline five key steps to help managers understand the importance of organisational data: identifying challenges, assessing their impact, analysing root causes, finding solutions, and continuously monitoring effectiveness.

The practitioner's expertise, which includes consultants, managers, and other professionals working within the same organisation, serves as the third source of evidence. Practitioners cannot operate on intuition or personal opinion. Barends and Rousseau (2018) identify three situations in which professionals can work: when they have numerous opportunities to practice, when their practice yields clear feedback, and when they operate in a consistent and predictable environment.

This belief directly contradicts Schein's (1988) process consultation model, which posits that managers are unable to diagnose the problem or convey it to the consultant accurately; instead, they only have a vague sense that something is wrong. A significant human factor at play is the tendency for managers to experience insecurity when faced with complex decision-making scenarios (Gill & Whittle, 1993). Guest (1992) argued that the help of a professional can lead the manager to favour external solutions on two levels: streamlining the decision-making process and eliminating unnecessary deliberation.

The fourth source of evidence is stakeholder influence. Freeman and Reed's (1983) definition is particularly suitable, as it broadly identifies the stakeholder as any person or group that can influence, or be influenced by, an organisation's achievement of goals.

This goes beyond Clarkson's (1995) definition, which focuses too much on the claims and interests of stakeholders as the organisation's primary focus, potentially overlooking other challenges that might arise. Meanwhile, Barends and Rousseau (2018) provide practical tools, such as stakeholder maps and power/interest diagrams. These tools assist managers in understanding stakeholders' needs, enabling them to evaluate information effectively and predict how their decisions might be received and their potential for success.

Vigilant decision making

Janis and Mann (1977) define vigilant decision-making as a careful, systematic process that involves critically evaluating all available evidence to reduce errors and bias. It emphasises allocating sufficient time to assess each alternative thoroughly, revisiting and reviewing information before making a final decision. Moreover, this approach consistently promotes thoughtful and deliberate choices, even when accounting for demographic differences. Day and Schoemaker (2008) further identify three characteristics that characterised vigilant managers: they maintain an outward focus and openness to diverse perspectives, apply strategic foresight to anticipate long-term effects, and cultivate a culture of inquiry by encouraging broad, exploratory thinking within their teams.

In view of the above, this study attempts to answer the following three research questions:

RQ1: To what extent do public service employees utilise the four sources of evidence when making important decisions?

RQ2: Does the utilisation of the four sources of evidence vary by gender, age, leadership status and level of education?

RQ3: Does the utilisation of sources of evidence predict vigilant decision-making after controlling for demographic variables?

Method

Sampling

A census-based sampling method was used for this study, allowing voluntary participation. At the time of the study, there were 14,514 public service employees across scales 2 to 7. Clearance to collect data was obtained from the Research & Personnel Systems Directorate at the People and Standards Division, as well as from the FEMA Research Ethics Committee. All employees received an email with a link to an online questionnaire, which remained open from January 12 to February 10 of 2025.

A total of 185 complete responses were collected. While the response rate of 1.3% may appear low, it is consistent with similar studies conducted within the Maltese Public Service (e.g., Cassar & Bezzina, 2021).

Table 1 below shows that the population and sample distributions did not differ from each other with respect to gender ($\chi 2 = 0.64$, df = 1, $p = 0.64$) and age ($\chi 2 = 3.67$, df = 4, $p = 0.30$) but was skewed with respect to the leadership status ($\chi 2 = 25.73$, df = 1, $p < 0.01$).

Demographic Variable	Sample	Population
Gender		
Male	87 (47.0%)	6,399 (44.1%)
Female	98 (53.0%)	8,115 (55.9%)
Leadership status		
Headship	88 (47.6%)	4,396 (30.3%)
Managerial	97 (52.4%)	10,118 (69.7%)
Age		
18-35	46 (24.9%)	2,951 (20.3%)
36-45	47 (25.4%)	4,282 (29.5%)
46-55	52 (28.1%)	3,776 (26.0%)
56+	40 (21.6%)	3,505 (24.1%)
Education		
Diploma	34 (18.4%)	NA
Tertiary	56 (30.2%)	NA
Masters	83 (44.9%)	NA
PhD/ Doctorate	13 (7.0%)	NA
Total	**185 (100.0%)**	**14,514 (100.0%)**

Table 1: Population and sample distributions

Measures

The study employed a questionnaire containing three sections. Section 1 gathered demographic information. Section 2 included 12 items, with 3 items pertaining to the utilisation of each of the four sources of evidence: scientific literature (e.g. "When making an important decision, I consult scientific literature published in academic and peer-reviewed journals"), organisational data (e.g., "When making an important decision, I consult evidence gathered and provided by the organisation such as data, facts and figures), practitioner expertise (e.g., "When making an important decision, I consult with professionals (e.g. managers, consultants, business leaders and practitioners) for their experience and judgements"), and stakeholder influence (e.g., "When making an important decision, I integrate the values, beliefs and viewpoints of stakeholders"). These items were specifically designed for this study after consulting relevant literature (e.g., Barends and Rousseau, 2018). Cronbach alpha coefficients were 0.85 for scientific literature, 0.77 for organisational data, 0.80 for practitioner expertise and 0.83 for stakeholder influence. Section 3 included 6 items measuring vigilant decision-making. These were taken from Mann et al. (1997). An example item is "When making an important decision, I take a lot of care before choosing" and the Cronbach alpha coefficient was 0.80. Participants rated each Likert-type item on a scale ranging from 1 = never to 5 = always.

Data Analysis Procedure

To answer RQ1, descriptive statistics were computed for the four variables representing the utilisation of specific evidence sources. For RQ2, a four-way Multivariate Analysis of Variance (MANOVA) was used. Wilk's Lambda was used to interpret the multivariate effect, while Bonferroni post-hoc tests were used to perform pairwise comparisons between group means in the presence of significant multivariate effects. Finally, for RQ3, we computed an aggregated score for the utilisation of the four sources of evidence (labelled as 'Utilisation'). Subsequently, a stepwise multiple regression was used, with vigilant decision-making as the dependent variables and the demographic variables (entered in the first step) and 'Utilisation' (entered in the second step), as predictors.

Results

RQ1: To what extent do public service employees utilise the four sources of evidence when making important decisions?

Table 2 provides summary statistics for the utilisation of the four sources of evidence. It shows that on a five-point scale ranging from 1 = never to 5 = always, the respondents reported, on average, that they 'often' utilise (on average) professional expertise, stakeholder values and organisational data, while scientific literature is utilised 'sometimes'. Although the mean scores were generally high, there was variation in the extent of dispersion, as reflected by the measures of spread.

Source of Evidence	M (SD)	Md (Q1-Q3)	Min-Max
Scientific Literature (SL)	3.42 (0.80)	3.33 (3.00-4.00)	1.00-5.00
Organisational Evidence (OE)	3.90 (0.75)	4.00 (3.67-4.33)	1.67-5.00
Professional Expertise (PE)	4.21 (0.62)	4.33 (4.00-4.67)	1.67-5.00
Stakeholder Values (SV)	4.13 (0.61)	4.17 (3.67-4.67)	2.00-5.00

Table 2: Descriptive Statistics (EBM sources)

RQ2: Does the utilisation of the four sources of evidence vary by gender, age, leadership status and level of education?

A four-way MANOVA was conducted to examine the effect of the demographic variables (gender, age, education and leadership status) on the use of the four sources of evidence (see Table 3).

Effect	Wilk's	F	df_1	df_2	Sig.
Intercept	0.03	1453.90	4.00	174.00	<0.01
Gender	0.99	0.45	4.00	174.00	0.77
Age	0.96	0.97	8.00	348.00	0.46
Education	0.87	2.12	12.00	460.65	0.02
Leadership Status	0.98	0.79	4.00	174.00	0.53

Table 3: MANOVA Output

Table 3 shows that only education produced a significant multivariate effect. Follow-up univariate ANOVAs revealed that education differed significantly across groups ($F(3, 177) = 3.61$, $p = 0.01$). Bonferroni post-hoc tests showed that those in possession of a doctorate made a significantly higher use of scientific literature in their decision making than those in possession of a Masters degree (mean diff. = 0.66, SE = 0.23, $p = 0.03$), an undergraduate degree (mean diff. = 0.78, SE = 0.25, $p = 0.01$) or secondary/post-secondary education (mean diff. = 0.81, SE = 0.29, $p = 0.03$.

RQ3. Does the utilisation of sources of evidence predict vigilant decision-making after controlling for demographic variables?

The ANOVA table revealed that the F-statistic was statistically significant ($F(5, 179) = 20.02$, $p < 0.01$), while the coefficients table (see Table 4) revealed that utilisation of the sources of evidence was statistically significant ($\chi = 0.55$, $t = 9.01$, $p < 0.01$), after controlling for the demographic variables. This implies that as the utilisation of the sources of evidence increased, vigilant decision making increased. The Durbin-Watson (DW) statistic was close to 2 ($DW = 1.997$) suggesting no autocorrelation in the residuals while the VIFs were all close to 1, suggesting that multicollinearity was not an issue (Cramer, 2003).

Dependent Variable: Vigilant Decision-Making

Model	B	S.E.	Beta (β)	t	Sig.	VIF
(Constant)	2.232	0.280		7.977	<0.001	
Gender	0.091	0.059	0.093	1.530	0.128	1.022
Education	0.073	0.037	0.130	1.972	0.050	1.217
Leadership Status	0.001	0.064	0.001	0.009	0.993	1.261
Age	0.045	0.024	0.118	1.881	0.062	1.107
Source Utilisation	0.522	0.058	0.552	9.006	<0.001	1.049

Table 4: Regression output

Discussion

The study provides meaningful insights into the utilisation of sources of evidence in the Maltese public service context. Firstly, the observed preference for professional expertise, stakeholder influence, and organisational data over scientific research findings mirrors trends reported in earlier EBM literature, which often find research findings struggling to gain traction in practice due to perceived inaccessibility, limited applicability, or time constraints (Barends et al., 2017). This suggests that despite increasing advocacy for EBM, barriers to the practical integration of academic research remain persistent in real-world decision-making environments (Rynes & Bartunek, 2017).

Secondly, a notable finding of the study is the limited influence of demographic variables—such as gender, age, and leadership status—on source utilisation. This indicates that patterns in the utilisation of sources of evidence may be culturally or structurally embedded across the public service rather than individually driven.

The exception, however, lies in education, where those with doctoral-level qualifications are more inclined to utilise scientific research findings (Namono et al., in press).

This supports the idea that advanced education may increase individuals' capacity or confidence to access and apply scholarly evidence, perhaps due to greater research literacy or exposure to academic norms.

Thirdly, the study found that overall utilisation of sources of evidence significantly predicted vigilant decision-making, even after controlling for demographics. This reinforces the conceptual link between comprehensive evidence use and high-quality decision processes.

Vigilant decision-making—a culturally systematic, thorough, and evaluative approach (Janis & Mann, 1977)—appears to benefit from drawing on multiple evidence types, underlining the practical value of cultivating broader evidence literacy within public service settings (Rousseau, 2006).

These findings carry practical implications for the Institute for the Public Service in their remit, which was established as an autonomous entity to study and research public administration and management, both in theory and in practice. First, they highlight the need for additional strategies adopted by the Institute to make scientific research more usable and relevant to practitioners, potentially through targeted training or enhanced knowledge translation mechanisms. Second, the predictive role of evidence use in vigilant decision-making supports investment in initiatives that promote systematic evidence consideration, as such practices are likely to yield more thoughtful, accountable decisions.

Conclusion

Decision makers need to consider insights from multiple sources, rather than relying solely on a few, to ensure a comprehensive approach (Barends & Rousseau, 2018). This leaves no room for "fast" and intuitive thinking, which can lead to biases and errors in judgment (Kahneman, 2011).

Despite some notable findings, there are limitations in the study that should be acknowledged. First, the study focuses on the extent to which sources of evidence are utilised without assessing the depth, appropriateness, or rigour with which these sources are applied. Second, the study adopts a cross-sectional design, and hence, no causal inferences can be made.

Third, the study utilised a sample skewed in terms of leadership status; however, leadership status did not influence the utilisation of sources when compared to managers, suggesting that the over-representation of heads over managers should have minimal impact on the average evidence use in the overall population. Further research could provide additional insights by adopting a longitudinal design and by delving into the quality and appropriateness of how the sources of evidence are applied in decision-making.

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