Exploration of benefits realisation management for teledermatology scale-up framework development and sustainable scaling

Laticha Elizabeth Marolana Walters[a,b,*], Richard Ernest Scott[a,c,d], Maurice Mars[a]

[a] *Department of TeleHealth, Nelson R. Mandela School of Medicine, University of KwaZulu-Natal, 719 Umbilo Road, Congella, 4013, Durban, South Africa*
[b] *Council for Scientific and Industrial Research, Meraka Institute, Meiring Naudé Road Brummeria, Pretoria, South Africa*
[c] *Department of Community Health Sciences, University of Calgary, Canada*
[d] *NT Consulting, Global e-Health Inc., Calgary, Alberta, Canada*

ARTICLE INFO

ABSTRACT

Introduction: Realisation of proven telemedicine scale-up benefits is a key consideration for South Africa, a developing country with a quadruple disease burden, inequitable access to healthcare, and ineffective and inefficient specialist referral pathways. Proven benefits of teledermatology include virtually enhancing access of rural communities to scarce urban specialist dermatologists, reducing time to triage of skin lesions, frequently an initial sign of underlying disease, and timely treatment initiation. Benefits realisation management (BRM) is a recognised means of managing how resources are invested into making effective and desirable changes, and enhancing project and programme success. The need for this study was identified in a recent review and critique of teledermatology and related scale-up frameworks. This study explores the use of BRM as a whole life-cycle approach applied to ehealth or teledermatology related scale-up framework development, and to sustain benefits of scaling ehealth or healthcare service delivery interventions.
Material and methods: A structured search of academic literature was performed using Scopus, Science Direct, PubMed, IEEE Explore, Web of Science, and Google Scholar. The key terms Benefits Realisation Management or BRM were linked with: a) ehealth or telehealth or telemedicine or teledermatology related scale-up framework development, and b) sustainability of interventions such as scale-up. Subsequent Google searching explored grey literature evidence for BRM in ehealth.
Results: The academic literature searches could not identify peer-reviewed literature to support the use or consideration of BRM as a whole life-cycle approach within ehealth or teledermatology related scale-up framework development.
Discussion: However, the results showed that BRM has been used in related domains to promote sustainability of non-healthcare interventions. In contrast the grey literature provided evidence of limited use of BRM within healthcare and within ehealth.
Conclusions: There is renewed support for the use of BRM as a whole life-cycle approach for management disciplines that focus on change, project, programme, and portfolio management. Although limited, the academic and grey literature provides support for consideration of BRM in ehealth, and for the use of BRM to ensure sustainability. Future research should explore the use of BRM as a whole life-cycle approach for ehealth implementation, and teledermatology scale-up framework development in particular, including its possible contribution to sustaining scaled-up teledermatology.

1. Introduction

South Africa's ehealth strategy, launched in 2012, supports the use of telemedicine to enhance access to scarce specialists, particularly for poor and rural communities [1]. Telemedicine relates to the use of information and communication technologies (ICT) to improve access to healthcare, and teledermatology (TD) is the practice of telemedicine for dermatology [2].

International empirical evidence supports the benefits of telemedicine [3] and TD in enhancing access to scarce dermatologists [4].

The benefits of TD have been understood in KwaZulu-Natal, a province in South Africa, since 2003. A local videoconference TD service reduced referrals from peripheral hospitals by 75% [5]. However, successful and sustained scale-up of its use to benefit the more than 60 state hospitals in the province without a dermatology service has not been realised.

Scale-up of proven ehealth service delivery interventions to provide anticipated benefits are desirable goals. The World Health Organization's Expandnet programme defines scale-up as "deliberate efforts to increase the impact of successfully tested health innovations so as to benefit more people and to foster policy and programme development on a lasting basis" [6; p2]. Sustainability is simply the ability to be maintained on a longterm basis at a certain rate or level of activity.

A recent review and critique of TD in South Africa provided lessons on previous implementation and scale-up attempts and proposed the need for a structured scale-up approach through the development of a TeleDermatology Scale-up Framework (TDSF) [7]. The lessons learnt were: embracing bottom-up provincial progress, ensuring alignment with government top-down approaches, meeting an evidenced-based health need, ensuring cultural and technological readiness, ensuring leadership and stakeholder buy-in, providing business and financial planning, and service monitoring [7]. The lessons were used as inputs towards the definition of TDSF design requirements obtained from key stakeholders: management and consultant urban dermatologists; referring rural doctors; infrastructure support team members; and ehealth and Information Technology governance management [8]. A follow-on study found no TDSF and no ehealth related scale-up frameworks that fully met the locally defined design requirements [9]. The TDSF design requirements identified the need for the adoption of a Benefits Realisation Management (BRM) approach "as a means to assist with making the TD referral pathway efficient, effective and equitable" [9; p146] meaning BRM is integrated from the outset to the completion of the scale-up project, thus establishing a whole life-cycle (start to finish) approach versus a standalone activity. BRM forms part of the KwaZulu-Natal's TDSF design requirements that were not met [9]. Use of BRM as a whole life-cycle approach in ehealth related scale-up frameworks was limited to traditional financial and project measurement criteria of return on investment, cost, time, and quality respectively [9]. Development of a TDSF and associated process to assist with realising and sustaining TD benefits on a wider scale is considered to align with the ExpandNet definition of scale-up which emphasises "deliberate efforts to increase impact" [6; p2].

BRM is an approach associated with change that contains elements of performance, stakeholder, change, project, progamme and portfolio management disciplines. It is variously defined or described. The Office of Governance Commerce in the United Kingdom described BRM as an uninterrupted process through the complete life cycle [10] that should be the "core process of any change initiative" [11; p29]. Sigma described BRM as "the process of organizing and managing, so that potential benefits, arising from investment in change, are actually achieved" and argued that "The only valid reason for investing in change is to generate benefits" [11; p29, p31]. The literature provides evidence of a renewed focus on the use of BRM and its contribution to project success [12]. Furthermore, entities that actively manage benefits of strategy implementations "waste 67% less money" [13; p3].

The use of BRM, as a whole life-cycle approach to ensure scaled and sustained benefits, could prove of value to scale-up framework development for ehealth in general, and for TD in particular. The National Health Service in England has adopted benefits realisation as part of its IT-enabled transformation programme, but a recent study indicated the "need to embed it within and across" hospitals [14; p16].

Given that BRM has the potential to facilitate the successful development and implementation of ehealth, and TD in particular, this study explored the evidence-base for using BRM as a whole life-cycle approach, and its possible contribution to sustaining scaled-up TD. Specifically, the study investigated the academic and grey literature evidence-base for use of BRM as an approach to ehealth, telemedicine, or TD related scale-up framework development, and sustainability of ehealth service delivery interventions such as scaled-up TD.

2. Material and methods

Two research questions needed to be answered; a) has BRM been used as an approach to ehealth, telemedicine, or TD related framework development, and b) has BRM been used as an approach to ensure sustainability of healthcare service delivery interventions such as scaled-up TD? Structured literature searches were performed using the bibliographic databases Scopus, Science Direct, PubMed, IEEE Explore, Web of Science, and Google Scholar. In addition, subsequent searching using Google was completed to gather insight from the grey literature regarding application of BRM in the ehealth sector.

For investigating BRM as an approach to ehealth, telemedicine, or TD related-scale-up framework development the key terms used for Scopus, Science Direct, PubMed, IEEE Explore searches were: "benefits realisation management" or "benefits realization management" linked with "*dermatology" or "*health" or "telemedicine" in title, keyword, or abstract with publication date prior to 2017 and language 'English'. For Web of Science and Google Scholar, the key terms "benefits realisation management" or "benefits realization management" were searched in the title and, from these, a secondary search used the terms "*dermatology" or "*health" or "telemedicine" in abstracts or keywords. After duplicates were removed, full-texts were screened for the inclusion criterion - use of BRM as an approach in scale-up framework development.

For investigating BRM as an approach to ensure sustainability of healthcare service delivery interventions such as scaled-up TD, key terms used for Scopus, Science Direct, PubMed, IEEE Explore searches were "benefits realisation management" or "benefits realization management" linked with "sustain*" in title, keyword, or abstract with publication date prior to 2017, and language 'English'. For Web of Science and Google Scholar, searches began with key terms: "benefits realisation management" or "benefits realization management" in title and then, from these, secondary searches for the term "sustain*" in abstract or keywords. After duplicates were removed, the full-texts were screened by all authors for the inclusion criterion - use of BRM as an approach to ensure sustainability of healthcare service delivery interventions. For the purposes of this paper any 'intervention' was considered.

For the grey literature search in Google, the search term was 'benefits realisation management in ehealth' with the first 100 hits reviewed.

3. Results

BRM as an approach in ehealth, telemedicine, or TD related scale-up framework development. Eight records were identified and after removal of one duplicate, it was found that no record met the inclusion criterion. However, the seven identified papers were analysed, and showed that BRM had been used in healthcare related domains in four ways:

  i) *Development of a model for healthcare infrastructure projects.*
 ii) *Development of an evaluation framework for nursing workforce development projects.*
iii) *Reflecting on systems development of a clinical trials support system.*
iv) *Exploring BRM as a strategic organisational capability.*

BRM as an approach to ensure sustainability of healthcare service delivery interventions such as scaled-up TD. Thirty records were identified, and nine duplicates removed. Of the 21 papers remaining, none met the inclusion criterion. However, six reported BRM having been used in various non-healthcare interventions in four ways:

i)   *As a driver in building an information modelling environment.*
ii) *As a contributor in construction and IT service management.*
iii) *As a contributor to return on investment in construction, fuel and retail industries.*
iv) *As a contributor to sustainable competitive advantage in building information modelling, construction, and IT service management.*

The academic literature also provided some additional implementation recommendations and challenges.

In contrast to the academic literature, the grey literature did show evidence of application of BRM by some governments, including specifically in the healthcare and ehealth domains, in the UK, Canada, Australia, Ireland, New Zealand, and South Africa.

4. Discussion

No academic literature was found on the use of BRM as an approach to scale-up framework development for ehealth, telemedicine, or TD. Nor was evidence found for BRM being used as an approach to ensure sustainability of healthcare service delivery interventions. However evidence from the grey literature revealed its use in the healthcare domain in other ways.

There are a number of definitions or descriptions of Benefits Realisation Management (BRM; also known as benefits realisation [15], benefits evaluation [16], project benefits management [17] or, originally, benefits management [18]). Benefits Management, a term first used in the late 1980s and pioneered primarily in the UK during the 1990s, has had limited impact and limited academic scrutiny [19]. One definition places BRM specifically within the realm of IT or ICT implementation: "the process of organizing and managing, such that the potential benefits arising from the use of I[C]T are actually realised" [20; p197]. Given that ehealth is simply the "use of information and communication technologies (ICT) for health" [21] this places BRM within the ehealth domain. BRM was first applied in the UK, an early adopter, by the Office of Government Commerce around the turn of the century [10]. Its importance within ehealth was evidenced by NHS Digital in the UK quoting the Cabinet Office as describing benefits realisation as the single most important strategic driver for programmes [22].

First, in relation to BRM as an approach in ehealth, telemedicine, or TD related scale-up framework development. BRM has been used to develop a model for healthcare infrastructure projects. Four papers reported the use of BRM in the BeReal model in healthcare infrastructure projects, developed by the Health and Care Infrastructure Research and Innovation Centre (HaCIRIC), and based on a case study within the Manchester, Salford, and Trafford (MaST) Local Improvement Trust (LIFT). These papers documented four development stages towards the BeReal model: a case study process and BRM literature review [23]; description of the need for BRM and a whole life cycle programme and projects' management approach [24]; the importance of using BRM during planning, development, delivery and operational phases including the benefit of using collaborative ICT tools [25]; and an analysis of the BeReal model's contributions to benefit generation within a healthcare redevelopment programme [26].

BRM has also been applied to development of an evaluation framework for nursing workforce development projects. 'Skills for Health' in the UK developed a framework to evaluate the benefits of workforce development projects in the public sector [27]. The framework was developed to assist practitioners to "identify, describe, measure, and evaluate the benefits of workforce development projects" [27; p685]. It was tested in three National Health Service Trusts in the UK, and the results were used to inform improvements [27]. Implementation concerns were quality, usability, organisational willingness, and formation of change management culture [27].

In addition, BRM was explored for its strategic organisational capability. Here, an understanding was sought of the National Health Service (NHS) management's view of BRM as a strategic organisational capability in the acute hospital sector. The results suggested that "much more needs to be done in developing staff" and BRM needs to be seen as a core organisational capability [14; p2]. Finally, BRM was used for reflection on systems development of a clinical trials support system. This extended from an overview of clinical trials support, through discussion of the need for a BRM approach, to assessment of the chosen approach [28].

Second, in regard to BRM as an approach to ensure sustainability of healthcare service delivery interventions such as scaled-up TD, BRM has again been used. While no healthcare related examples were found, 6 papers reported BRM having been used in various non-healthcare interventions, again in four ways.

BRM was described as a driver in building an information modelling environment. Within software engineering, information modelling presents the concepts, relationships, constraints, rules, and operations for a given domain. Sanchez et al. recognised BRM as one of the drivers to ensure sustainability in this setting [29].

BRM was also used as a contributor in construction and IT service management (ITSM). ITSM refers to the implementation and management of IT services that meets business needs [30; p32]. In a guide for the construction industry the use of BRM in conjunction with a lean approach was linked to the ability to sustain benefits for longer [31], while Mcloughlin et al. [32] identified BRM as providing elements to ensure sustainability in ITSM.

BRM was further described as a contributor to return on investment in the construction, fuel and retail industries. Specifically, BRM has been linked with sustaining benefits for longer in the construction industry [31] and in the fuel and retail sectors [33].

Finally, BRM was identified as a contributor to sustainable competitive advantage in building information modelling, construction, and IT service management. Love et al. used BRM in building information modelling, which is the digital representation of physical and functional characteristics of a building or facility [34]. Smith applied BRM in construction to achieve a sustainable competitive advantage [31]. Lastly, sustainability was discussed in benefits identification to craft a competitive advantage from operational effectiveness and strategic positioning [32].

The literature also provided some additional insight regarding implementation recommendations and challenges. The whole life-cycle approach is intentional and requires change over a prolonged period, which could be challenging for public health moving through regime changes. Sanchez et al. found it challenging to obtain literature support for criteria to measure sustainability in the building information modelling environment [29]. Soomere showed that the mindset of key stakeholders and management, and availability of resources, can be a challenge [33]. The BeReal authors' suggested that benefits could be impacted by regime and policy changes [24]. Dickerson et al. referred to concerns about quality, usability, organisational willingness, and formation of a change management culture in their workforce development framework [27].

Other recommendations from the literature to consider when using BRM included the need for continual organisational improvement, ongoing training, and development [14,31,33]. An additional need is for development of measures and controls for process owners, and both commitment and change from key stakeholders towards effective governance and management with regular monitoring during and after project closure [12,31,33]. A further need was for establishment of strategies to ensure integration [12] and assignment of responsibilities for achieving and measuring benefits [32].

Although little evidence has been available of the impact of BRM methodologies [35], this has since changed with the use of BRM linked to project and programme success [36]. Indeed, all of the noted academic literature highlights a growing body of knowledge and understanding about the value of using BRM to enhance project success [12] and ensure sustainability [37], but not within ehealth overall or

development of a TDSF specifically.

Although the formal academic literature search revealed little, hand searching for the terms benefits realisation and ehealth provided evidence of BRMs application in the UK, Canada (termed both Benefits Evaluation and Benefits Realisation), and more recently in Australia, New Zealand (termed Benefits Management), Ireland, and South Africa. Even a 2014 update to The Philippines eHealth Strategic Framework and Plan was reported to acknowledge and identify Benefits Realisation [38].

The UK was one of the first countries to acknowledge and employ BRM principles and processes, including in ehealth. The UK Government embraced BRM early on, both nationally and regionally [10]. In Scotland, the eHealth Benefits Management Toolkit was introduced in 2009 to support NHS Boards and to encourage adoption of benefits management approaches for all ehealth projects and programmes [39]. Wales, through NHS Wales, also introduced a Benefits Realisation Framework in 2005 in order to evaluate the effectiveness of any changes introduced in its 'Agenda for Change' which focused on health human resource aspects not ehealth [40]. However, BRM or its equivalent was not mentioned in the 2016 eHealth and Care Strategy for Northern Ireland [41].

In Canada, Canada Health Infoway instigated a focus on Benefits Evaluation associated with ehealth implementation in 2007 publishing its Benefits Evaluation Framework and related Indicators intended to assess its return on investments [16,42,43]. This Framework, or adaptations, has been applied in several Canadian Provinces. In Manitoba, Manitoba eHealth used its own benefits evaluation framework, adapted from Infoway's version, to assess an eReferral project and to identify opportunities for improvement and inform future planning related to eReferral adoption, usage, and optimisation [44]. British Columbia (BC) leveraged the Infoway Benefits Evaluation Framework to estimate some of the benefits realised by BCs long history of ehealth investments [45]. These included Panorama, a public health surveillance application, and two telehomecare heart failure pilot projects [45,46]. eHealth Ontario used benefits realisation for planning, measuring, evaluating, and feedback, similar to benefits realisation management as a whole life-cycle approach, and evaluated the clinical and financial value contribution of the Province's ICT assets. In its most recent update (2016) eHealth Ontario also described its ConnectingOntario Benefits Realisation Forum (BR Forum), launched in 2015, which is intended to facilitate knowledge sharing and enhance application of benefits evaluation to improve ehealth adoption and implementation [47].

The Australian Government highlighted the general value of BRM in 2012 [48], as well as for healthcare but not specifically for ehealth implementation. Shortly thereafter, its application to ehealth was recognised in at least 2 States. In New South Wales (NSW), HealthShare NSW introduced its own BRM toolkit in 2012 in order to offer a standard approach to manage programmes and prove benefits, including in regard to ehealth [49]. Later the NSW Government introduced a comprehensive *Benefits Realisation Management Framework* [50]. Similarly, Victoria presented its Benefits Realisation Core Report in 2013, to present benefits realisation concepts, tools and techniques (and some key measures) applicable to the health sector, including ehealth [51].

In New Zealand, the New Zealand Government (through its Treasury department) introduced BRM for projects and programmes by publishing its own 'Guide for Practitioners' [52]. This took a life-cycle approach to BRM and was recommended for use throughout the State sector. Earlier this year Ireland also promoted the use of a benefits realisation framework and practices within an ehealth programme business case [53].

Within South Africa benefits realisation is one of ten priorities supported by a plan to specify health outcomes [1]. Similar to many countries, the health sector already utilises health indicators to monitor and evaluate the impact of health interventions [54]. However, they are not used in a whole life-cycle approach [55] from benefit identification, through strategic alignment and ensuring realisation during

implementation, to ensuring sustainability after project completion [37]. Such an approach could markedly benefit scaling and sustainability of ehealth and specific applications like TD.

More recently, in South Africa, the National Health Insurance (NHI) scheme [56] was introduced. This is a health financing system to increase access to healthcare services, and is aligned with WHO's universal health coverage [57] and the United Nation's Sustainable Development Goal 3 [58]. The NHI is mandated by South Africa's National Development Plan 2030 [59]. The NHI's information systems are expected to report on the use of the service delivery benefits, and the plan described for introducing a benefits advisory committee (which will then establish a Planning and Benefits Design Unit), is similar to the Benefits Realisation Forum established in Ontario, Canada.

A recent review reflected on "evidence on the association that Benefits Realisation Management has with project success" and the positive role towards successful realisation of business intent [12; p64]. This, and the renewed focus on BRM in project management [12,55], supports exploration of its use as a whole life-cycle approach in TDSF development, and ehealth overall.

For many years general consensus has been that for ehealth to be considered successful it must become fully integrated and simply another routine option for healthcare delivery. For this to be achieved, ehealth interventions must be both scaled and sustained. In turn, those interventions will have been health-needs based, and be of proven value – i.e. to have had their benefits realised. This study illustrates that Benefits Realisation Management has shown promise for ehealth implementation in several countries, but that academic evidence is lacking. Research to better understand the evidence for benefits realisation of ehealth and TDSF development is desirable.

In 2008 Wootton noted "little routine telemedicine activity" relating to scale-up at the national health level in developing nations [60]. Although dated, little has changed. Mangham and Hanson (2010) and Yamey (2011), also confirmed the need for scale-up of health interventions [61,62]. Given this need, and the potential for BRM to assist, application of BRM to scale-up and sustainment of ehealth interventions should be critically researched.

5. Conclusions

The scale-up and ongoing sustainability of successful but limited ehealth interventions such as TD remains a problem in the developing world. BRM, with a whole life-cycle approach, has not yet been applied to developing ehealth scale-up frameworks for specific applications like TD. However, available health-related and non-health related academic and grey literature suggests its potential value should be actively researched to gather evidence.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and material

Not applicable.

Conflicts of interest

The authors declare that they have no competing interests.

Authors' contributions

LEMW, MM and RES conceived the need to write this paper. LEMW,

MM and RES screened papers for inclusion. LEMW and RES performed the initial data collection and analysis, and wrote the first draft of the paper. LEMW, MM and RES reviewed and revised the manuscript for substantial intellectual content. All authors read and approved the final version for submission.

Funding

Acknowledgements

References

[1] South Africa National Department of Health. National eHealth Strategy South Africa 2012/13-2016/17 Archived by WebCite® at http://www.health.gov.za/index.php/2014-08-15-12-54-26/category/95-2012s?download=171:ehealth-strategy-south-africa-2012-2016; 2012, Accessed date: 25 November 2018http://www.webcitation.org/71LOG67Ea.

[2] American Telemedicine Association. Practice Guidelines for Dermatology. 2016 (Archived by WebCite® at http://hub.americantelemed.org/resources/telemedicine-practice-guidelines?CLK=5c1536e8-2c94-4d54-ab39-8c1f64be3f9fhttp://www.webcitation.org/71LUAGqFD accessed 25 Nov 2018.

[3] Bashshur RL, Howell JD, Krupinski EA, Harms KM, Bashshur N, Doarn CR. The empirical foundations of telemedicine interventions in primary care. Telemed J e Health 2016;22(5):342–75https://doi.org/10.1089/tmj.2016.0045.

[4] Bashshur RL, Shannon GW, Tejasvi T, Kvedar JC, Gates M. The empirical foundations of teledermatology: A review of the research evidence. Telemed J e Health 2015;21(12):953–79https://doi.org/10.1089/tmj.2015.0146.

[5] Mars M, Dlova N. Teledermatology by videoconference: Experience of a pilot project. S Afr Fam Pract 2008;50(3):70https://doi.org/10.1080/20786204.2008.10873725.

[6] World Health Organization. Nine steps for developing a scaling-up strategy. Geneva, Switzerland: WHO and ExpandNET; 2010 (Archived by WebCite® at http://www.who.int/immunization/hpv/deliver/nine_steps_for_developing_a_scalingup_strategy_who_2010.pdfhttp://www.webcitation.org/6yNiHHFHY accessed 25 Nov 2018.

[7] Walters LEM, Mars M, Scott RE. A review and critique of teledermatology in the South African public health sector. In: Maeder AJ, Ho K, Marcelo A, Warren J, editors. The promise of new technologies in an age of new health challenges. Selected papers from Global Telehealth 2016. 231. Amsterdam, Netherlands: IOS Press; 2016. p. 143–51https://doi.org/10.3233/978-1-61499-712-2-143.

[8] Walters LEM, Scott RE, Mars M. Design requirements for a teledermatology scale-up framework. SACJ 2018;30(1):128–60https://doi.org/10.18489/sacj.v30i1.559.

[9] Walters LEM, Scott RE, Mars M. Teledermatology scale-up frameworks: a structured review and critique. BMC Health Serv Res 2018;18(613):1–9https://doi.org/10.1186/s12913-018-3418-x.

[10] Office of Government Commerce (OGC). Managing successful programmes. London: London Stationery Office Books; 2003. 25 Nov 2018.

[11] Bradley G. Benefit realisation management: A practical guide to achieving benefits through change. second ed. Surrey, England: Gower Publishing Limited; 2010. 25 Nov 2018.

[12] Serra CEM, Kunc M. Benefits realisation management and its influence on project success and on the execution of business strategies. Int J Proj Manag 2015;33:53–66https://doi.org/10.1016/j.ijproman.2014.03.011.

[13] Project Management Institute. Strengthening benefits awareness in the C-suite: Benefits realization management. USA: PMI; 2016http://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/strengthen-benefits-awareness-csuite.pdf accessed 25 Nov 2018.

[14] Waring T, Robson A, Casey R. Benefits Realisation in acute hospitals in England-A Strategic management perspective. Evid Based Inform Syst 2014;1(1)http://nrl.northumbria.ac.uk/24114/1/5-24-1-PB.pdf, Accessed date: 25 November 2018.

[15] ITGI. The Val IT Framework 2.0. Printed in United States of America: ITGI IT Governance Institute)978-1-60420-066-9; 2008 Report No. http://www.isaca.org/Knowledge-Center/Val-IT-IT-Value-Delivery-/Pages/Val-IT1.aspx accessed 25 Nov 2018.

[16] Lau F, Hagens S, Muttitt S. Proposed benefits evaluation framework for health information systems in Canada. 2007 Contract No.: 1 https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/benefits-evaluation/2915-a-proposed-benefits-evaluation-framework-for-health-information-systems-in-canada?Itemid=101 accessed 25 Nov 2018.

[17] Zwikael O, Chih Y-Y. Project benefit management: Formulation and appraisal of target benefits. Project Management Institute Research and Education Conference; Phoenix, AZ. PA: Newtown Square; 2014https://www.pmi.org/learning/library/project-benefit-management-8957 accessed 25 Nov 2018.

[18] Association for Project Management. Benefits management. 2017https://www.apm.org.uk/body-of-knowledge/delivery/scope-management/benefits-management/ accessed 20 Mar 2018.

[19] Breese R. Benefits realisation management: Panacea or false dawn? Int J Proj Manag 2012;30:341–51https://doi.org/10.1016/j.ijproman.2011.08.007.

[20] Ward J, Elvin R. A new framework for managing IT-enabled business change. Inform Syst J 1999;9:197–221. 3 https://doi.org/10.1046/j.1365-2575.1999.00059.x.

[21] World Health Organization. eHealth at WHO. 2018http://www.who.int/ehealth/en/(Archived by WebCite® at http://www.webcitation.org/71LTyTYg8 accessed 01 Aug 2018.

[22] NHS Digital. Benefits management: Summary. 2018https://digital.nhs.uk/what-is-nhs-digital/what-we-do/benefits-management accessed 20 Mar 2018.

[23] Harris K, Sapountzis S, Kagioglou M. The methodological development of a Benefits Realisation Management Process (BRMP) in the case of Manchester, Salford and Trafford (MaST) Local Improvement Finance Trust (LIFT). 8th BuHu International Postgraduate research conference Built and Human Environment, 26 - 27 June 2008; Prague, Czech Republic. 2008http://usir.salford.ac.uk/id/eprint/18406 accessed 25 Nov 2018.

[24] Sapountzis S, Harris K, Kagioglou M. The development of a Benefits Realisation Management Process to drive successful programmes and projects. PM-04 - 4th SCPM & 1st IPMA/MedNet Conference, 29-31 May 2008; Chios Island, Greece. 2008 accessed 25 Nov 2018.

[25] Yates K, Sapountzis S, Lou E, Kagioglou M. BeReal: Tools and methods for implementing benefits realisation and management. Proc 5th Nordic Conference on Construction Economics and Organisation, Reykjavík, Iceland, 10-12 June. 2009 accessed 25 Nov 2018.

[26] P. Tillmann, P. Tzortzopoulos, S. Sapountzis, C. Formoso, M. Kagioglou. A case study on benefits realization and its contributions for achieving project outcomes. In: Proceedings for the 20th Annual Conference of the International Group for Lean Construction: Challenging Lean Construction Thinking: Are we near a Tipping Point? 18–20th July 2012; San Diego, California, USA. Available at: http://eprints.hud.ac.uk/id/eprint/21074/1/TillmannTzortopoulosSapountzisFormosoKagioglou_2012_Case_Study_on_Benefits_Realisation_and_its_Contributions_for_Achieving%C5%A0.pdf, accessed 19 February 2019.

[27] Dickerson C, Green T, Blass E. Workforce development and effective evaluation of projects. Br J Nurs 2014;23(12):685–90https://doi.org/10.12968/bjon.2014.23.12.685.

[28] Doherty N, Dudhal N, Coombs C, Summers R, Vyas H, Hepworth M, et al. Towards an integrated approach to benefits realisation management – Reflections from the development of a clinical trials support system. Electron J Inf Syst Eval 2008:83–90http://www.ejise.com/issue/download.html?idArticle=723 accessed 25 Nov 2018.

[29] Sanchez AX, Hampson KD, Mohamed S. Delivering value with BIM: A Framework for built environment practitioners. CIB World Building Congress 2016, 30 May – 3 June; Tampere, Finland. 2016http://eprints.qut.edu.au/97639/ accessed 25 Nov 2018.

[30] AXELOS Limited. ITIL glossary and abbreviations. 2011https://www.axelos.com/Corporate/media/Files/Glossaries/ITIL_2011_Glossary_GB-v1-0.pdf accessed 20 Mar 2018.

[31] Smith S. Implementing Lean in construction: Lean benefits realisation management. London, UK: CIRIA, Classic House; 2013https://eprints.qut.edu.au/71034/1/71034.pdf accessed 25 Nov 2018.

[32] McLoughlin S, Scheepers H, Wijesinghe R, editors. Benefit planning management for ITSM: Evaluating benefit realization frameworks. Proceedings of the 25th Australasian Conference on Information Systems. ACIS; 2014http://hdl.handle.net/10292/8065 2014 , accessed 25 Nov 2018.

[33] Soomere A. Improving benefits realisation management process in Statoil Fuel & Retail As [Dissertation]. University of Tartu; 2013.

[34] Love PED, Matthews J, Simpson I, Hill A, Olatunji OA. A benefits realization management building information modeling framework for asset owners. Autom ConStruct 2014;37:1–10https://doi.org/10.1016/j.autcon.2013.09.007.

[35] Lau E. OECD e-Government project, benefits realisation management. 2007http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=GOV/PGC/EGOV(2006)11/REV1&docLanguage=En; accessed 25 Nov 2018.

[36] Project Management Institute. Success Rates Rise: Transforming the high cost of low performance? Online: PMI, Contract No. 8th Global Project Management Survey; 2017http://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/pulse-of-the-profession-2017.pdf accessed 25 Nov 2018.

[37] Project Management Institute. Beyond the project: Sustain benefits to optimize business value. 2016 Online: PMI http://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/sustain-project-benefits-optimize-value.pdf accessed 25 Nov 2018.

[38] Republic of the Philippines Department of Health. Philippines eHealth strategic framework and plan 2013-2017 - Updates May 2014. SlideShare: Slideshare.net. p. 2014https://www.slideshare.net/ExistPH/e-health-for-health-it-conference accessed 25 Nov 2018.

[39] NHS Scotland. eHealth Benefits Management Toolkit. eHealth: Benefits Management; 2009http://www.ehealth.nhs.scot/wp-content/uploads/sites/7/2015/09/eHealth-Benefits-Management-Toolkit-Overview-Presentation-Benefits-Management1.pdf accessed 25 Nov 2018.

[40] NHS Wales. Agenda for change: Benefits realisation framework. Wales; 2005http://www.wales.nhs.uk/sites3/documents/433/Benefits Framework Final.pdf accessed 25 Nov 2018.

[41] Health. Social Care Board. eHealth and Care Strategy for Northern Ireland.

2016https://www.health-ni.gov.uk/sites/default/files/publications/dhssps/interactive-ehealth-strategy.pdf accessed 25 Nov 2018.

[42] Canada Health Infoway. Benefits evaluation indicators. Technical report version 2.0 2012https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/450-benefits-evaluation-indicators-technical-report-version-2-0 accessed 25 Nov 2018.

[43] Canada Health Infoway. Benefits evaluation indicators. Technical report version 1.0 2006https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/328-benefits-evaluation-indicators-framework-report accessed 25 Nov 2018.

[44] Telehealth MB. eReferral and consultation – A benefits evaluation. 2016https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/benefits-evaluation/2872-manitoba-ereferral-and-consultation-benefits-evaluation accessed 25 Nov 2018.

[45] British Columbia Ministry of Health. Benefits Evaluation Report: Telehomecare Heart Failure Pilot Projects Ministry of Health; 2013https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/benefits-evaluation/1671-benefits-evaluation-report-telehomecare-heart-failure-pilot-projects?Itemid=101 accessed 25 Nov 2018.

[46] British Columbia Ministry of Health. Benefits Evaluation Report: Immunization Management and Family Health Modules Ministry of Health; 2015https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/benefits-evaluation/2773-bc-panorama-benefits-evaluation-report-for-immunization-management-and-family-health-modules accessed 25 Nov 2018.

[47] eHealth Ontario Planning and Reporting Division. Benefits realization update 2016. Ontario, Canada: eHealth Ontario. 2016https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiAg8mbi_vZAhWrJcAKHY77AUgQFggmMAA&url=https%3A%2F%2Fwww.ehealthontario.on.ca%2Fimages%2Fuploads%2Fpages%2Fdocuments%2F2016_Benefits_Realization_Update_EN.pdf&usg=AOvVaw1wbjsn3N0st4gu0R4pwHmD; accessed 25 Nov 2018.

[48] Australian Government Department of Finance and Deregulation. Assurance review process - Lessons learned: Benefits realisation management. 2012https://www.finance.gov.au/publications/gateway-publications/docs/Benefits_Lessons_Learned_flyer.pdf accessed 25 Nov 2018.

[49] HealthShare New South Wales. Benefits delivery essential toolkit. 2012https://www.aci.health.nsw.gov.au/ie/projects/benefits-realisation-guide/guide/benefits-delivery-tool-v8.xlsm accessed 25 Nov 2018.

[50] New South Wales Government. Benefits Realisation Management Framework. Australia: Sydney, NSW Government; 2015https://www.finance.nsw.gov.au/publication-and-resources/benefits-realisation-management-framework accessed 25 Nov 2018.

[51] State of Victoria. Benefits Realisation Core Report: Guide for Victorian Public Health Services Melbourne: Department of Health; 2013https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiMyuXx9cnYAhVJ7IMKHf7MCqkQFggsMAA&url=https%3A%2F%2Fwww2.health.vic.gov.au%2FApi%2Fdownloadmedia%2F%7B292CCE60-09BF-43B3-A32C-41D07741EE22%7D&usg=AOvVaw1f5lw7vGwSq5L1mBvQi3rK accessed 25 Nov 2018.

[52] New Zealand Government. Managing benefits from projects and programmes: Guide for practitioners. 2017http://www.treasury.govt.nz/statesector/investmentmanagement/plan/benefits/guidance/managingbenefits-guidance.pdf accessed 25 Nov 2018.

[53] eHealth Ireland. eHealth benefit areas. 2018http://www.ehealthireland.ie/Knowledge-Information-Plan/Roadmap-for-Delivering-the-New-Capabilities/eHealth-Benefit-Areas/ accessed 25 Nov 2018.

[54] Health Systems Trust (HST). Health Indicators. 2017http://www.hst.org.za/healthindicators accessed 20 Mar 2018.

[55] Project Management Institute. Benefits realization management framework. USA: PMI; 2016http://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/benefits-realization-management-framework.pdf accessed 25 Nov 2018.

[56] South Africa National Department of Health. National Health Insurance for South Africa towards Universal Health Coverage. 2017 (Archived by WebCite® at http://www.gov.za/sites/www.gov.za/files/40955_gon627.pdfhttp://www.webcitation.org/6wJ2uRFUb accessed 25 Nov 2018.

[57] World Health Organization. Global diffusion of eHealth: Making universal health coverage achievable. Geneva: Global Observatory for eHealth (GOE) series; 2016http://apps.who.int/iris/bitstream/10665/252529/1/9789241511780-eng.pdf accessed 25 Nov 2018.

[58] United Nations. Progress towards the Sustainable Development Goals. United Nations. 2017http://www.un.org/ga/search/view_doc.asp?symbol=E/2017/66&Lang=E; accessed 25 Nov 2018.

[59] South Africa National Planning Commission. National Development Plan 2030. 2012http://www.gov.za/sites/www.gov.za/files/Executive Summary-NDP 2030 - Our future - make it work.pdf accessed 25 Nov 2018.

[60] Wootton R. Telemedicine support for the Developing World. J Telemed Telecare 2008;14(3):109–14https://doi.org/10.1258/jtt.2008.003001.

[61] Mangham LJ, Hanson K. Scaling up in international health: What are the key issues? Health policy and planning 2010;25(2):85–96https://doi.org/10.1093/heapol/czp066.

[62] Yamey G. Scaling up global health interventions: A proposed framework for success. PLoS Med 2011;8(6):e1001049https://doi.org/10.1371/journal.pmed.1001049.