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HEALTH SERVICE MANAGEMENT TO IMPROVE DISASTER RESILIENCE - CASE STUY FOR IMPLEMENTING LEAN IN REGIONAL HOSPITAL HEALTH SERVICE

Abstract

Introduction: Healthcare services are required to provide different needs and services at short notice within systems which have unclear processes and are inundated with organisational issues. However, economic instability, increased demand and frustrated staff have compromised the quality of service offered. Consequently, Central Queensland Health and Hospital Service (CQHHS) sought a reliable management and leadership method to revamp the way business was conducted. The authors, therefore, discuss the logistics of introducing Lean at an organisational level, with multiple layers of management and other challenges of having a hub and spoke model, as well as multiple sites separated by large geographical areas. Methods: This work is a result of literature study of various materials, logical reasoning as well as practical experience of implementing lean management system in CQHHS. Results: Structured implementation of Lean philosophy in the organisation; targeted improvement project implementation and resource allocation based on thorough analysis of value streams, as opposed to relying upon functional managers.

Key words: Lean, Toyota management system, process improvement, healthcare redesigning, quality improvement

AZ EGÉSZSÉGÜGYI MENEDZSMENT JAVÍTÁSÁNAK LEHET SÉGEI A KATASZTRÓFAVÉDELEMBEN – ESETTANULMÁNY A LEAN MÓDSZER BEVEZETÉSÉR L

Absztrakt

Bevezetés: Az egészségügyi szolgáltatásoknak rövid id n belül különböz igényeket kell kielégíteniük még abban az esetben is, ha az egészségügyi rendszer bonyolult folyamatokkal és szervezési problémákkal néz szembe. A gazdasági instabilitás, a növekv kereslet, valamint a csalódott dolgozók tovább veszélyeztethetik a már meglév szolgáltatás min ségét. Ennek a problémának a megoldására a Central Queensland –i Egészségügyi és Kórházi Szolgálat (CQHHS) megbízható vezetési és szervezési módszert keresett. A cikkben a szerz k az úgynevezett "Lean" módszer bevezetésének lényegét és logikáját mutatják be. Módszerek: A szerz k a kutatás során tanulmányozták a különböz releváns nemzetközi szakirodalmakat és ezek alapján a gyakorlati tapasztalatok felhasználása mellett a logikai érvelés módszerét alkalmazták. Eredmények: A cikk eredményeként megállapítható, hogy a "Lean" módszer strukturált formában megvalósítható az egészségügyi szervezetben.

Kulcsszavak: Lean módszer, Toyota irányítási rendszer, folyamat javítás, egészségügy átalakítása, min ség javítás.

INTRODUCTION

The challenges faced by Central Queensland healthcare system were common throughout the Australian healthcare system, especially in the regional and rural healthcare services (Australian Institute of Health and Welfare (AIHW). [1] These challenges included, but were not limited to, significant consumer safety issues, long waiting lists, service accessibility, low staff morale, poor retention of staff and

struggling to meet accreditation requirements. As a result, the otherwise well motivated, trained and highly intelligent staff are constantly frustrated as they have to struggle to provide band aid measures on daily basis. Consequently, the health and hospital service struggled to retain the workforce. Furthermore, struggling to meet the national safety and quality accreditation scheme for healthcare services literally translated to the organisation's failure to provide expected level of care to consumers (Department of Health and Ageing (DoHA). [2] Due to the above mentioned challenges and the need to meet the increased demand, under budget constraints as well as integrating new technologies, Central Queensland Hospital and Health Services sought an effective and reliable management and leadership method to revamp the way business was conducted. This would enable the delivery of highly reliable, safe practices and better quality of care to consumers. The National Safety and Quality Health Service (NSQHS) Standards were developed to drive the implementation of safety and quality systems and improve the quality of healthcare in Australia.

Following consumer safety debates, and with the struggle to meet accreditation requirements, in February 2014, the Central Queensland Chief Executive Officer and the Board of Directors discussed the introduction of a new reliable management system. Lean methodology was proposed as the management of choice. In healthcare, Lean philosophy has been described as a consumer-focused approach which puts an emphasis on eliminating waste in order to create efficiencies at all points of care delivery. [3] It was clearly the management system required by the Central Queensland Hospital and Health Service due to its emphasis on a consumer-first approach, quality and safety, and staff or employee satisfaction.

The pandemic application of Lean in the UK National health services has been met with a variety of responses, ranging from undoubted success to criticism of potential industrialisation of healthcare provision. [4] Critics questioned whether Lean tools and techniques would continue to deliver, or produce further positive efficiencies since its inception in healthcare, especially public healthcare services. In such services the consumer is not clearly defined and reinvestment of released capacity is not automatic, resulting in challenges in defining value and developing flow successively. [5]

TOP MANAGEMENT ENDORSEMENT

The CQHHS Chief Executive Officer had previous extensive experience in implementing Lean philosophy in the NHS within the UK. Several UK hospitals had started to look for new concepts and have been introducing Lean thinking as a proven methodology for improving flow. The Chair of the Board also had experience in implementation of total quality management approaches by Edward W. Deming. At one of the strategic away days, the chief executive officer gave an example of the use of Lean at Virginia Mason, which is the most heralded success story of Lean implementation in healthcare in literature. It successfully adopted Toyota Production System and has been an exponent of Lean techniques since 2000. Healthcare organisations from different parts of the world have visited Virginia Mason to learn how to implement this management methodology. [6]

Organisational commitment from the Board and executive team members was sealed and confirmed. However, it was agreed that, despite the hospital and health services having the full delegation to make the decision to implement the philosophy, the chief executive and the board would also have opportunistic conversations with the Director General and Minister of Health. These were all supportive of the idea. According to Joosten, Bongers, and Janssen [7] it is vitally important to engage executive management and leadership teams first to foster support from the very top levels of the organisation, when initiating Lean implementation. Liker concurs by stating that successful implementation of Lean philosophy is a long-term commitment, which requires endorsement from the top leadership. [8] In addition, principle number one for Toyota management system encourages organisations to base their management decisions on long term philosophy even at the expense of short term goals. CQHHS decided to be the first HHS to implement Lean this way with this principle of investment for the future rather than immediate short term benefits.

In the State of Queensland a small number of health and hospital services have experimented with Lean initiatives for specific projects. However, none had introduced Lean as a specific management and leadership system for the whole organisation. The growing number of failed Lean implementations were characterised by cookie cutting approaches of directly copying from Toyota. Lean leadership is what most organisations underestimate or get wrong. According to Liker and Convis the reason why most organisations fail in their Lean transformations is because they do not understand the power or importance of Lean leadership and respecting people. [9] Organisations need executive decision makers who understand and appreciate the power of the Lean philosophy. [10]Even though Lean is the continuous elimination of waste, focusing on just processes and not the people leads to a scattered improvement approach resulting in a loss of competitive advantage. Liker argues that companies need to go back to a more systematic and scientific approach to improvement, which cannot be achieved through implementation of Lean tools alone, without appropriate Lean leadership that respects the people. [8] Lean leadership is different from traditional conventional leadership. It is about coaching subordinates to problem-solve and create habits for improvement that become so engrained that you do not think of doing it. It encourages learning at *Gemba*. *Gemba* kaizen is learning which occurs at the factory floor via real life problem-solving. [11]

KAIZEN PROMOTION OFFICE (KPO) - SERVICE TRANSFORMATION TEAM

The organisation created a Kaizen Promotion Office (Service Transformation Team) led by Executive Director of Operations and Innovation, to guide the process and avoid the start-stop culture in the embedding and implementation of the CQWay. The Director of Operations and Innovations had vast experience of implementing Lean in the UK, in both industry and healthcare. According to Graban, hiring inexperienced employees for the Kaizen Promotion Office is a recipe for failure. [12] If the KPO leader has little experience they will not have credibility with the organisation leadership team, resulting in little ability to coach or run Lean events or projects.

The rest of the team was made up of local clinicians and people who were enthusiastic about the philosophy. LikeR in his principle 9 of Toyota management system, suggests that any organisation which wants to adopt Toyota Production System should first identify Lean zealots; that is people who eat, breathe and sleep the philosophy. [8] The local staff provided internal expertise to ensure that the philosophy suited local needs and not just imitating other organisations. They also ensured that Lean activities continued after the external expert departed. The internal stakeholders used their expertise to translate Lean from general tools and principles to their local context. According to Black and Miller, [11] the KPO, also known by several different names such as JIT Promotion Office, Lean function, Lean office, company or business production system office, continuous improvement office, operational excellence group in different organisations plays a major role in any successful Lean transformation. [8] Despite the different names, the goal of KPO is to make an enterprise kaizen-ready and that was accomplished.

Both the KPO and the Kaizen Operation Teams (KOTs) build capacity for continuous improvement in the CQHHS region by advising, coaching, training and acting as change management catalysts. According to Black and MilleR, the service transformation team facilitates and propagates a daily *kaizen* culture; coaching and teaching staff at all levels, managers, physicians, clinicians and staff about Lean principles and tools. [11] The Central Queensland Health and hospital service KPO, under the guidance of Rona Consulting, ensured that the organisation did not customise the methodology too soon.

STRATEGIC –OBEYA ROOM

Obeya is Japanese term which means big room or war room. According to Liker and Convis [9] the *obeya* serves two main purposes; information management and on-spot decision making. At Toyota, the *obeya* is where all individuals involved in the managerial planning of the products and processes development, meet to expedite

communication and decision-making. This reduces the delays which can be caused through standalone departmental decision-making process; subsequently improving team spirit at executive and strategic level. The *obeya*, in this study, contained visually engaging charts and graphs relevant to key performance indicators, progress toward performances targets and strategic goals, counter-measures to technical and scheduling issues as shown in Figures 1, 2 and 3.

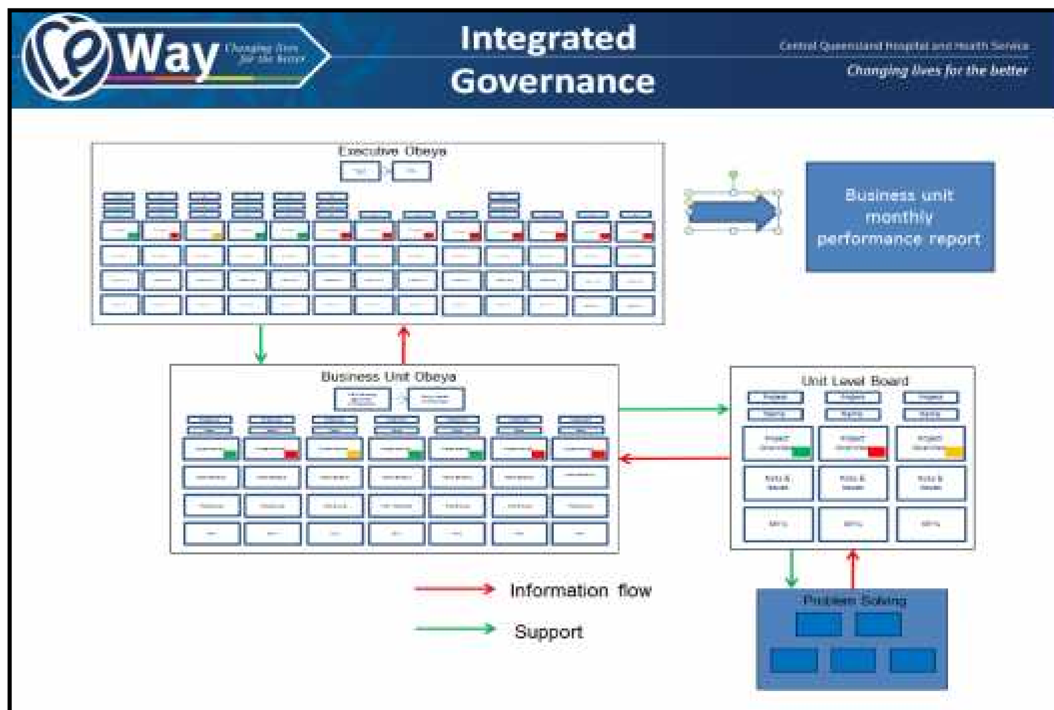


Figure 1: Obeya Metric Displays

Figure 2: Obeya Strategic KPIs

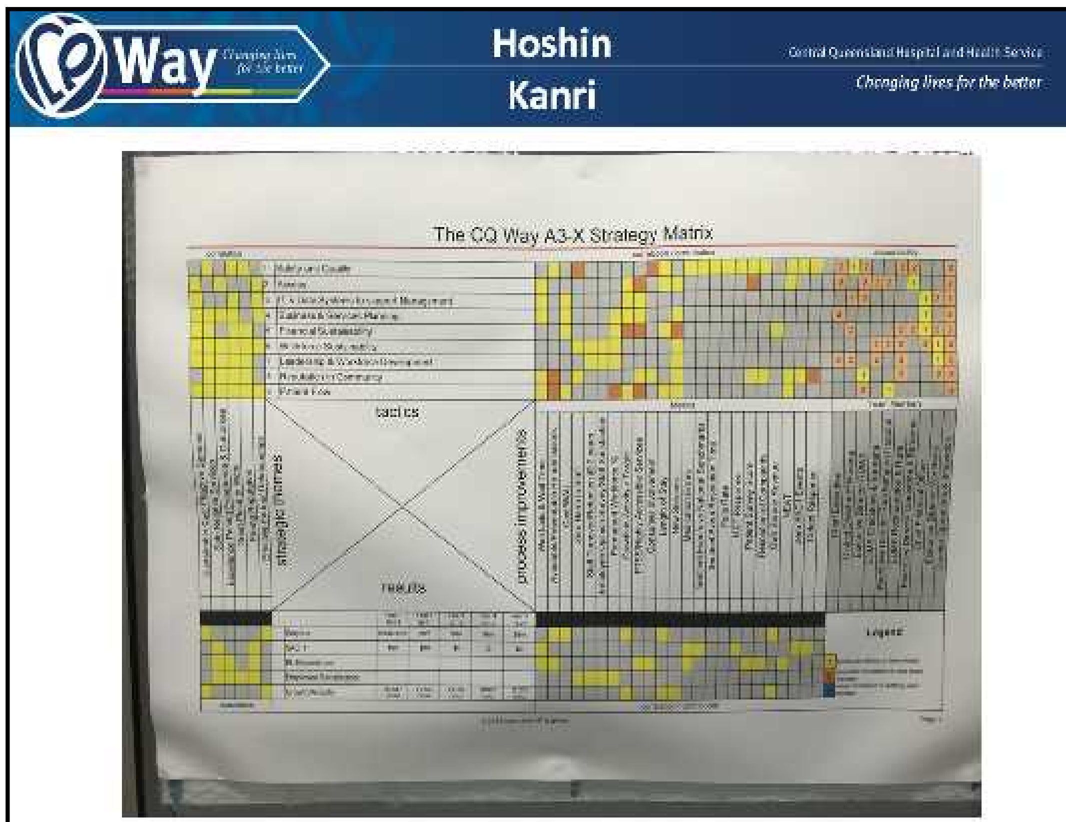


Figure 3: Obeya Hoshni Kanri

The creation of an *obeya* room is seen to be vitally important when organisations introduce Lean thinking. [8] This is a room where the strategic vision was located. All Central Queensland healthcare services strategic planning happened in this room. Stand up meetings and progress reporting on Lean initiatives for the executives was conducted in this room at a designated time every week. The executives met in the *obeya* once every week. The entire executive team attended the *obeya* stand up meetings; hence the right people were in the same room analysing strategic goals and how the organisation was meeting the key performance indicators. This allowed them to make quick decisions if changes had to be made. This did not negate the principle 13 of Toyota management system, *nemawashi,* where decisions are made through long discussions and consensus before implementation. [8]

However, in instances where quick decisions had to be made, the *obeya* facilitated this. Cross-functional executives were in attendance and actively participated in the decision making process; thus it ensured high level cooperation from different

departments. This is contrary to traditional strategic implementations in healthcare business which led to *silo* working due to decisions being made in silos at the top and cascaded in that pattern right to the bottom by frontline staff. Support and engagement of other departments was sort early in the process. This approach resulted in better communication, expeditious implementation of strategic goals, great team work and respect amongst different teams.

ADAPT LEAN TO THE LOCAL CONTEXT

Healthcare organisations have to interpret and adapt Lean to the Local context. Central Queensland Hospital and Healthcare Service had to interpret and adapt Lean in a particular distinct way to meet the needs and challenges of the Central Queensland region, hence the birth of the CQWay. The CQWay is a management and leadership approach to continual service improvement, which helped Central Queensland to identify and eliminate waste and inefficiencies in many of the processes that were part of the health care experience.

This made it possible for staff to deliver the highest quality and safest consumer care. CQWay was aligned to the Lean methodology which originated from the Toyota production system and was pioneered by Toyota and Taichi Ohno. [13] The aim of the CQWay was to achieve the best quality, lowest cost, shortest lead time, best safety and high morale.

The CQWay focused on re-envisioning and reconfiguration of the whole consumer's journey from a consumer's perspective, respecting the ideas and work of others, giving frontline staff the time and tools to tackle problems and taking small gradual improvement steps, as well as big radically improvement steps. According to Liker (2004), there must be no misconceptions that Lean is a program that can be purchased off the shelf and installed.

Many decisions are required before adapting Lean methodology; such as who the internal/external consumers are, the tools to be used and how they would be used. Many generic concepts need to be adapted for local use, and many adjustments are needed over time, and all this requires resources. [11]

The board members and executives of the CQHHS launched the CQWay on October the 2nd, 2015. Central Queensland region covers a huge geographical area. During the tour of CQ by Rona Consulting, staff appeared sceptical about the introduction of a new management and leadership system since they had previously been engaged in some improvement initiatives with no positive sustainable outcomes. Moreover, staff in rural areas were also sceptical that the CQWay was one of the initiatives which would be focused on the main hub, Rockhampton.

In spite of all this scepticism, there was a huge attendance and presence of Board members in different Central Queensland locations when the CQWay was launched to show that this was not just another initiative but a well-supported and sustainable transformation. Simultaneous launching at different centres in the whole region also showed the commitment of the top leadership in introducing the philosophy to the whole region of Central Queensland; thus reducing the myth that already existed within the region that all new systems and service approaches focused on the main hub Rockhampton leaving out other surrounding areas.

CQWAY IMPLEMENTATION

The CQWay was seen as a lifelong journey for the organisation. According to Liker (2004), implementation of Lean is a long term philosophy. It is a fundamental shift in how staff work, think and focus on the consumer like never before. The introduction of the CQWay was a decisive and positive shift in how CQHHS and all the staff thought and acted in day-to-day delivery of services. However, the changes were steady, progressive and continuous. According to Liker it is better to work like a tortoise than to work like a hare. [8] He further states that decisions should be made slowly to expeditiously implement actions. The organisational framework which was used in implementing Lean in CQHHS is the Toyota management system which is represented diagrammatically by the Toyota house in Figure 4.

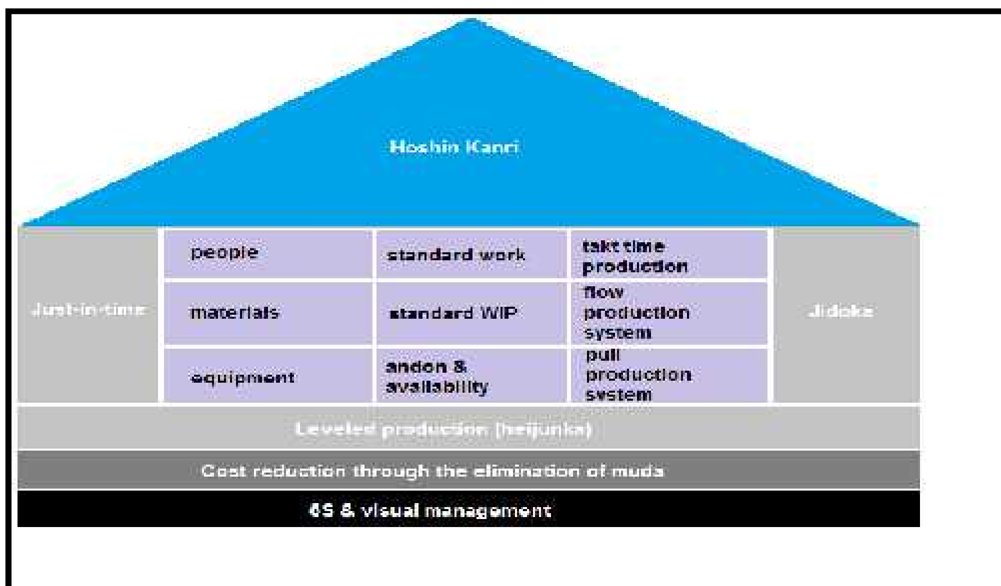
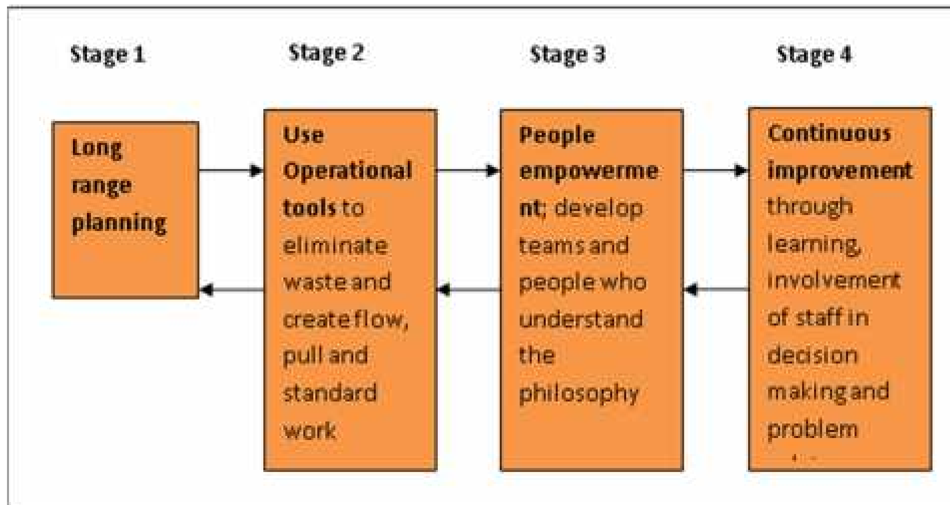


Figure 4: Toyota House

Introduction of the Lean methodology to CQHHS was systematic, following the Toyota house and 4Ps models as shown in Figures 4 and Table 1 respectively.

Table 1: 4P Model of Lean



4P's Principles

Philosophy

Base management decision on a long term philosophy, even at the expense of short-term financial goals.

Processes

Create continued process flow to bring problems to the surface

- Use pull system to avoid over production
- Level out the workload
- Build a culture of stopping to fix problems, to get quality right the first time.

People and partners

- Grow leaders who thoroughly understand the work, live the Lean philosophy, and teach the Lean philosophy to others.
- Develop exceptional people and teams who follow the organisation's philosophy
- Respect for the organisation's extended network of partners and suppliers by challenging them and helping them improve.

Problem solving

Go and see for yourself to thoroughly understand the situation

- Make decision slowly by consensus, thoroughly considering all options; implement decisions rapidly
- Become a learning organisation through relentless reflection and continuous

improvement [8]

Lean implementation initially targeted the most high volume consumer areas with high waiting times. According to Burgess and Radnor, when implementing Lean it is important to start with areas where you can gain early wins to foster buy-in from staff. The two key areas which were identified were:

1. Orthopaedics
2. and Out-patient departments [14]

The first steps programme was focussed on developing improvement work in cardiology and in orthopaedics clinics. Basic Lean tools were implemented, 5S, and daily work to improve the environment, the stock holding and adherence to standard work, etc. Orthopaedic consumers had some of the longest waits to be seen in out-patients. In December 2014 there were 2000 people waiting to be seen and more than half of them had been waiting longer than their recommended time. Therefore, an agreement was made during the first steps programme to work to a revised clinic schedule which put in place the number of clinic slots per week, to not only keep pace with demand, but also reduce the backlog for consumers waiting. The new clinic schedule sought to reduce the waiting times so that by November 2015 all consumers would have been seen within their recommended waiting times.

To achieve this, a thorough diagnosis of the demand for the service was conducted using value stream mapping. In addition, the capacity was matched through changes to the clinic schedule in order to meet demand. For example, from the value stream analysis, the Consultant out-patient sessions were found not to add value to some consumers' journey; for example, those presenting with back, foot and ankle problems. The working group agreed to change the pathway whereby consumers were streamlined to the appropriate allied health professional rather than just generically booking an appointment with the orthopaedic surgeon. This improved the consumers' journey; giving them local and quicker access to the clinicians.

Achievements from the trial period (first steps programme) were desirable; hence, the board of directors' consideration to extend the contract. According to Radnor, Holweg and Waring [15] Lean does not conclude after the first wave of projects.

Plans were made to sustain Lean and to continuously evaluate and adjust previous changes and to plan further change. Although it had taken Virginia Mason 5-7 years to gain meaningful results the CQHHS Board agreed to a three-year contract, considering that Rona Consulting had gained valuable experience since the introduction of Lean at Virginia Mason. The contract was endorsed to continue implementation of Lean principles using the group transformation program under the guidance of Rona Consulting for three years at a cost of equivalent to 2.4 million US dollars.

KEY ACHIEVEMENTS

At the time of writing up this article, 24 healthcare leaders had been trained to gain Lean facilitation certificates so that they could run *kaizen* workshops. Key elements of the CQWay were trialled in CQHHS out-patient departments. The staff who delivered the services were involved in the planning and implementation of the improvements, while the managers provided the support and trust needed to implement changes. The results were outstanding. CQHHS had one of the best performing out-patients services in Queensland and the staff involved expressed satisfaction with the results as they felt valued in the change and implementation of the new processes. In January 2015, following a workshop on scheduling for orthopaedics, a new clinic template was introduced to increase the number of available appointments.

Over the period, a full waiting list audit that resulted in the removal of a number of consumers from the list was performed It introduced a different method of offering/booking the appointments via an opt in method and, if the consumer was not contactable or did not respond within a prescribed timeframe, their referral was removed. The doctors were educated around the out-consumers implementation standard regarding ‘Fail to Attend’ consumers which resulted in better compliance with the standard recommending the removal of the consumer from the waiting list if they failed to attend their booked appointment.

The data on the relationship between the Lean workshops and the decreased waiting list had not been published, nor validated at the time the article was written. While the data certainly supported that there was a marked reduction in the waiting list and consumers seen within the clinically recommended timeframes, it could only be anecdotally linked to the introduction of Lean methodology. CQHHS was also in the middle of improving theatre processes and had just started an improvement in the way the organisation responded to clinical incidents.

Healthcare is people intensive. Staff costs represent 75% of the healthcare costs. [16] As previously mentioned, it is the operational staff who are always frustrated due to lack of clear processes and standardised work in healthcare. As a result, the CQWay was about staff participation, sharing ideas and solutions. The CQWay focused on engaging staff to improve their daily work processes. Value stream mapping, increased visualisation, *kaizen* workshops, and creation of standard work, problem solving and checklists were the main activities in the CQWay.

In connection with the topic it is very important the research in connection with the disaster health basic. [17] A well-organised health care system can only work with a good authority system which is built in many European countries, for example in Hungary. [18]

SUMMARY

This paper presented how Lean was initiated successfully in regional health services. The purpose of this paper was to investigate requirements for implementing and sustaining Lean in regional, rural and remote health services which have challenges of multiple sites within huge geographical areas, workforce retention issues and significant variation in the quality of services provided in different locations. Key findings from the experience of improving health care service delivery through the framework of Lean Thinking methodology included the need for active engagement and involvement of top management, engagement of external experts and *senseis,* and

also adopting Lean in local context. This means that organisations have to find *senseis*, teachers who would coach and mentor the local staff so that they can understand the concept and live and breathe the philosophy.

REFERENCES

[1] Australian Institute of Health and Welfare (AIHW) (2014) *Australia's health 2014. Australia's health series no. 14*. Cat. no. AUS 178. Canberra: AIHW.

[2] Department of Health andAgeing (DoHA) (2013) *National Mental Health Report 2013: tracking progress of mental health reform in Australia 1993–2011*. Canberra: Commonwealth of Australia

[3] Kaplan, G. S. and Patterson, S. H. (2008) Seeking perfection in healthcare. A case study in adopting Toyota Production System methods. *Healthcare Executive*, 23(3), 16–21.

[4] Walley, P., Silvester, K., Steyn, R., and Conway, J. B. (2006) Managing variation in demand: Lessons from the UK National Health Service. *Journal of Healthcare Management*, 51(5),

[5] Esain, A., Williams, S., and Massey, L. (2008) Combining planned and emergent change in a healthcare Lean transformation. *Public Money & Management*, 28 (1), 21–26

[6] Virginia Mason (2008) *Alert system improves patient safety*. 2008VMPS facts. Retrieved from: https://www.virginiamason.org/home/workfiles/pdfdocs/press/2008_vmps_fastfacts_.pdfWeick, K. E., & Sutcliffe, [Accessed 28/03/15]

[7] Joosten, T., Bongers, I., and Janssen, R. (2009) Application of Lean thinking to health care: issues and observations. *International Journal for Quality in Health Care*, 21(5), 341–347.

[8] Liker, J. (2004) *The Toyota Way - 14 Management Principles from the World's Greatest Manufacturer.* New York, NY: McGraw-Hill.

[9] Liker, J. K. and Convis, G. L. (2012) *The Toyota Way to Lean Leadership - Achieving and sustaining excellence through leadership development.* New York: McGraw Hill.

[10] Waring, J. J. and Bishop, S. (2010) Lean healthcare: rhetoric, ritual and resistance. *Social Science & Medicine*, 71(7), 1332–1340

[11] Black, J. and Miller, D. (2008) *The Toyota Way to Healthcare Excellence: Increase Efficiency and Improve Quality with Lean*. Chicago: Health Administration Press.

[12] Graban, M. (2009). *Lean hospitals.* New York: Productivity Press.

[13] Womack, J. and Jones, D. (2003) Lean Thinking: Banishing waste and create wealth in your corporation. New York: Free Press.

[14] Burgess N. and Radnor Z. (2013) Evaluating Lean in healthcare. *International Journal of Health Care and Quality Assurance*, 26(3), 220–235.

[15] Radnor, Z.J., Holweg M, and Waring, J. (2012) "Lean in Healthcare: the unfilled promise?" Social Science & Medicine 74, pp. 364-371.

[16] Young, T. and McClean, S. (2008) "A critical look at Lean Thinking in healthcare", Quality and Safety in Health care, vol. 17 no. 5, pp. 382-386.

[17] KÓRÓDI GY: Disaster health basic; Henderson. DEVLART, LLC. 2016. 55 p. ISBN: 978-0-9977210-5-8

[18] KÁTAI-URBÁN L, VASS GY: Safety of Hungarian Dangerous Establishments - Review of the Industrial Safety's Authority; HADMÉRNÖK, IX.(2014) 1 pp. 88-95.

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