TQM and lean strategy deployment in Italian hospitals

Benefits related to patient satisfaction and encountered pitfalls

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Abstract

Purpose – This paper aims to contribute to the debate concerning total quality management (TQM)–Lean strategy in public healthcare by analyzing the deployment path for implementation, the possible benefits that can be achieved and the encountered pitfalls.

Design/methodology/approach – Three case studies are drawn from three large Italian hospitals with more than 500 beds each and structured with many departments. The hospitals are located in Tuscany, Italy. These three hospitals have embraced TQM and Lean, starting from strategic objectives and their deployment. At the same time, they have also implemented many TQM–Lean tools. The case studies are based on interviews held with four managers in each of these three public hospitals.

Findings – Results from the interviews show that there is a specific deployment path for TQM–Lean implementation. The hospitals have also achieved benefits linked to patient satisfaction and improved organizational performances. Problems related to organizational and cultural issues, such as senior managers' commitment, staff management, manufacturing culture and tools adaptation, could affect the benefits.

Research limitations/implications – The research has been carried out in just three Italian public hospitals. Hence, similar investigations could be managed in other countries. Researchers could also use a larger sample and investigate these issues by means of quantitative inquiry.

Practical implications – Practitioners could try to apply the deployment path revealed by these case studies in other public and private hospitals.

Originality/value – The results of this research show that there is a specific, new deployment path for implementing TQM–Lean strategy in some public hospitals.

Keywords Total quality management, Lean, Patient satisfaction, Performances benefits, Public healthcare, Strategy deployment

Paper type Case study

Introduction

Since the 1970s, competition on factors such as zero defects, process time reduction, cost reduction and relevant customization has increased. This scenario is the opposite of the so-called *mass production*, in which there is a huge demand for services and products, and services are provided with low-cost resources and with poor personalization and quality (Chiarini, 2013a).

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In the past decades, many industries, including public healthcare, have embraced strategies which stem from the Japanese industry, in particular total quality management (TQM) and Lean thinking. Since the introduction of TQM in the 1990s in healthcare (Marszalek-Gaucher and Coffey, 1993), process performance has improved, in particular customer satisfaction and error reduction (Baccarani and Castellani, 2008; Chiarini, 2013b; Garengo and Biazzo, 2013). TQM is based on the involvement of all the staff, including physicians, nurses and senior management. TQM has also introduced to healthcare the principle of *kaizen*, which is translated as continuous improvement (Imai, 1986; Bhuiyan and Baghel, 2005). As discussed in the next section, in the past few years, healthcare has incorporated Lean thinking with the aim of integrating it with TQM initiatives.

Lean is the term which Womack *et al.* (1990) coined in the 1990s through their famous book, *The Machine That Changed the World: The Story of Lean Production*. In this well-quoted book, the authors investigated different production systems within the automotive sector, including the Toyota Production System. The latter originated along with total quality control and management in the 1960s. The Toyota Production System proposes that companies have to avoid seven wastes that lead to a loss of efficiency and efficacy:

(1) overproduction;
(2) inventory;
(3) transport;
(4) motion;
(5) defectiveness;
(6) waiting; and
(7) over-processing (Chiarini, 2013a).

Teeuwen (2010) introduced an eighth waste specifically for the public sector. According to the author, underutilization of human skills is a waste that has to be taken into account when public organizations, including healthcare, deal with Lean implementation.

When it comes to deploying TQM and Lean strategy, these two systems generally bring to processes and the organization, a legacy of specific tools and principles used for reducing the above-mentioned wastes, including errors.

TQM and Lean stem directly from production and manufacturing management, in particular from the Japanese production system, but over time, they have been implemented in different environments such as the service industry and public administrations, including healthcare organizations.

Lean has received some criticisms that stem from its manufacturing and cultural foundation. Even so, as discussed in the next section, several authors consider Lean alone or combined with TQM suitable for healthcare organizations.

This paper wants to enlarge the debate concerning the possibility of implementing TQM and Lean strategy together in public healthcare organizations, by investigating the situation of three large Italian public hospitals where TQM–Lean has been applied in the past few years. The research is based on interviews with 12 managers within these hospitals, four for each hospital; the interviews produced information for discussing possible deployment paths for TQM–Lean strategy, the achieved benefits and the encountered pitfalls.

This paper is structured as follows. The next section deals with TQM–Lean strategy and the implementation path in public healthcare, as well as reviewing what other authors have investigated and found. This is followed by a section which describes the case studies and the methodology used for carrying out the interviews. Two core sections, first, analyze and discuss the findings from the interviews and, second, propose a deployment path and then group the benefits and the pitfalls related to TQM–Lean strategy. A conclusions section summarizes the results, practical implications and limitations and proposes an agenda for further research.

TQM–Lean strategy implemented in public healthcare

The TQM and Lean journey starts with the definition of strategic objectives usually set within a business plan (Hines *et al.*, 2004). Strategic objectives have to be deployed for a trickle-down effect at all the levels and within all the processes. According to Goetsch and Davis (2014), to encourage and make people enthusiastic toward quality management, and in particular toward continuous improvement, communication, training, involvement and reward are key elements. For instance, all the three hospitals are using an internal communication plan. Moreover, they are training and involving all the staff. Typically, TQM is more focused on strategic goals for providing safe and reliable healthcare to patients (Munechika *et al.*, 2014), whereas Lean is focused on waste reduction and time performances. In general, the shorter the processes, the leaner the organization and consequently less waste (Bell *et al.*, 2006). Thus, TQM–Lean strategies combined together are focused on the extreme simplification of the patient routing system with the intention of avoiding any kind of waste, including errors and cutting down costs.

TQM and Lean implementations require a deployment path. There are some differences in terms of quality management, process management and tools between TQM and Lean; however, TQM and Lean share the concepts of people and senior management involvement, customer satisfaction and continuous improvement (Pettersen, 2009).

When we come to Lean initiatives, specific tools such as 5S, Kanban, Total Productive Maintenance (TPM), Single-Minute-Exchange of Die (SMED) and many others invented by Toyota and other Japanese companies have to be used. 5S are five simple steps for setting in order and cleaning up all of the workplace; Kanban is a particular signal for reordering drugs and medical devices to reduce their amount; and SMED is focused on reducing change-over times of complex machines or processes such as operating theaters. (Chiarini, 2013a). Instead, TQM is more focused on tools linked to problem-solving to remove the root causes of waste (Pettersen, 2009).

According to Bell *et al.* (2006), agile and quick teams continually try to remove waste and solve problems. These teams usually manage initiatives called *kaizen events* (Manos and Alukal, 2006; Dickson *et al.*, 2009). A peculiarity of these improvement initiatives is the short duration and the maximum involvement of people (Liker and Meier, 2007).

Within the kaizen initiatives, self-empowerment and responsibility are as important as team building and team effort; more immediate TQM–Lean tools tend to be used instead of more complex ones such as advanced statistical tools (Schattenkirk, 2012).

The literature reveals the effect of TQM initiatives on healthcare and public healthcare starting in the 1990s, whereas Lean was applied to public healthcare almost a decade later. Since the beginning, the TQM movement has underlined the necessity of

involving senior management in the deployment of TQM initiatives and the setting of specific strategic objectives linked to quality and customer satisfaction (Swinehart and Green, 1995).

Huq (2005), for instance, analyzed the obstacles to TQM implementation in the service industry, including public healthcare. According to the author, hospitals are sometimes forced to implement TQM to increase patient satisfaction, and the main pitfall related to TQM implementation is a lack of senior management commitment.

It is taken for granted that TQM needs a strategic approach, whereas in public healthcare, Lean seems to be applied in a bottom-up way, introducing the principles of value and flow-time (Radnor, 2011). Radnor and Walley (2008) warn against treating Lean as just a combination of tools and suggest that Lean has to be implemented as a philosophy. An interesting case study from the National Health Service (NHS) Bolton Hospital in the UK shows how Lean tools inside NHS hospitals have to be adapted and personalized to the care processes. Moreover, organizational issues related to multidisciplinary teams and the many departments involved can represent an obstacle (Fillingham, 2008). A case study from France dealt with organizational pitfalls such as people involvement (Ballé and Régnier, 2007), whereas others discussed the difficulties of involving all staff and management (Radnor and Walley, 2008) and the lines of power inside departments which can act as a resistance (Waring and Bishop, 2010).

Interestingly, some authors also demonstrated that there could be barriers mainly linked to the typical manufacturing approach based on business logics (Radnor and Osborne, 2013), including unsuitable terminology (De Souza and Pidd, 2011), as well as a wrong cultural approach (Papadopoulos, 2011).

For instance, it is fundamental to understand that the customer is not the typical customer of other kinds of industries, but a patient, who is often a taxpayer, who takes for granted a certain level of satisfaction. In this sense, it is better to speak about patient satisfaction rather than customer satisfaction (Baccarani *et al.*, 2010). In the same way, terms like defect or product have to be transformed into something more suitable for service industry and healthcare such as error and service care (Chiarini, 2013c).

Last but not least, other case studies brought to light that public healthcare improvement initiatives tend to produce small-scale and localized productivity gains (Radnor *et al.*, 2012; Chiarini, 2012; Chiarini and Bracci, 2013).

To recap, TQM was applied to public healthcare before Lean. A strategic approach to TQM implementation is taken for granted, whereas Lean is based more on specific and operative tools. There is consensus in considering the combination of TQM–Lean as a possible strategy for reducing waste, costs and improving quality for patients. However, there are some criticisms especially concerning organizational difficulties such as management and staff involvement. Lean is also considered more bound to a manufacturing culture. Moreover, TQM–Lean implementation in a hospital as a whole can fail.

Taking into account these issues, we have tried to transform them into research questions for the interviewer guide discussed next.

The case studies and the interviews

The three case studies are drawn from three large Italian hospitals with more than 500 beds each and structured with many departments. The hospitals are located in Tuscany,

Italy. The manager who belongs to the third hospital wanted to remain anonymous. These three hospitals have embraced TQM or Lean starting from strategic objectives and their deployment. At the same time, they have also implemented many TQM–Lean tools.

The case studies are based on interviews held with four managers in each of these three Italian public hospitals. The managers from three different hospitals were chosen because they:

- have good skills on Lean and quality management tools;
- have managed TQM–Lean initiatives and they have used several TQM–Lean tools; and
- have experienced different kinds of organizational problems, for instance, relationships with senior management, and conflicts among team members, nurses, physicians and technicians.

The case study format presents some weak spots that could affect the research. In particular, it is practical, context-dependent knowledge and it is not as valuable as general context-independent knowledge. Ultimately, it is quite difficult to generalize on the basis of a few cases.

To collect data, a semi-structured interview method was used. To this end, an interviewer guide was developed before interviewing the managers. The interviewer guide contains some open questions that explore specific areas of interest and gives the possibility of finding a pattern among the answers. Table I shows the open questions used for the interviews.

Analysis of the results from the interviews

Each interview lasted for about half an hour. To obtain detailed data and information from the interviewee, we made the interviewees comfortable and we appeared to always be interested in what they were saying. We recorded and transcribed the interviews, then analyzed them and ruled out what represented just a personal opinion with no interest at all from a practical and theoretical point of view. For this aim, first, we avoided leading questions related to personal issues, and then we kept their personal opinions in check. In particular, we tried to ask more factual questions than questions about their opinions. For example, we asked "What TQM-Lean tools were used?" instead of asking "What did you think of these particular TQM-Lean tools?". We also used some probes, as needed, for instance, asking, "Would you give me an example of what you think about it? Would you explain that further?".

Going through the interview responses, we looked for patterns or elements among them, grouping the elements in a meaningful way. From the interviews many results emerged; the results below represent the interviewees' most important comments.

The strategic approach

In all the three hospitals, the TQM–Lean strategy was deployed first in a top-down way. This means that at the beginning of the journey, an internal sponsor rolled out the project. The interviewed managers discussed the importance of this figure, underlying how he or she has to be an inspired visionary and enlightened manager. In two cases, the sponsor was the general manager, whereas in the other case, he was the chief medical officer. In any case, the sponsor is part of top management. The interviewed managers

Interview focus: Implementation path, benefits and pitfalls in TQM–Lean strategy		
Interviewer guide	*Open questions*	*Notes*
1	Do you believe that a strategic approach is fundamental?	Discussion about the top-down and bottom-up approaches for implementing TQM–Lean, the encountered pitfalls and benefits
2	What are the main goals strategically pursued by the hospital?	Discussion about what kind of strategic objectives are pursued through TQM–Lean
3	What kind of performances has TQM–Lean improved?	Discuss improvements such as customer satisfaction, lead time, errors, transports and waiting lists. Discussion also about economic and financial benefits introduced and its quantification
4	Do you believe that the achieved improvements are general for the hospital or located just in a few departments?	Discuss the reasons that led to the success/ failure of the implementation for the hospital as a whole
5	What kind of organizational benefits and obstacles have you experienced?	Investigate organizational benefits/obstacles at any level and considering the hospital as a whole. Discuss also management and staff involvement, including relationships with senior management and team-working
6	Do you believe that the particular manufacturing approach and TQM–Lean culture could be an obstacle?	Investigate pitfalls related to the manufacturing origins of TQM–Lean tools and principles
7	Which kind of TQM–Lean tools have you implemented?	Investigate whether all the tools and principles can be implemented, the achieved benefits and the limitations

Table I.
The interviewer guide used for the interviews

underlined that it is fundamental that the sponsor be from top management because they worked in a large public hospital with a very complex organization. One of them, for instance, declared that in the past in the same hospital, a TQM project was launched within a single department with the commitment of just the head of the department and some physicians. The benefits achieved were several but they did not last: one year later, the department went back to the original conditions.

The interviewees also pointed out the importance of having a political sponsor outside the hospital. This probably is related to the typical Italian situation where senior managers within public hospitals are nominated by the health department of the local government which depends on the Italian NHS. Therefore, top managers and local government set the strategic goals and objectives for the hospitals, including TQM–Lean objectives, and these are stated within a yearly business plan.

The interviewed managers explained that for their hospitals, the first top-down approach included a management meeting with all the senior managers and the heads of the department and a strong internal communication. In one case, the deployment also led to the appointment of kaizen specialists who belong to a specific kaizen office. These

specialists support all the departments giving consultancy on TQM and Lean tools. The other hospitals appointed a specialist for each department.

All the interviewed managers declared that Lean was applied and deployed after TQM. TQM was the first strategy used to increase customer satisfaction. One of the interviewees said that in the past, patient satisfaction was a sort of emergency, and every public organization tried to implement TQM or other quality management systems. Patient satisfaction is usually measured through a standardized questionnaire with similar categories. Patient satisfaction is also measured by external and independent organizations linked to the health department of the local government. In this way, the three hospitals which belong to the same area can be easily compared by department, service and patient routing. Nowadays, he also said, patient satisfaction is still the most important objective; however, the importance of other important strategic objectives has increased.

The main goals pursued

But what kind of goals and objectives did the hospitals pursue through a TQM–Lean strategy? According to the interviewed managers, patient satisfaction is fundamental. In the course of time, mainly because of the economic crisis, budgets for public healthcare have been cut; as a consequence, it is important to do better with less. The interviewed managers explained how the local government is demanding more quality and less waste for each hospital. The senior managers of the three hospitals try to pursue cost reduction objectives by means of TQM and, especially, Lean.

The Lean theory clearly shows that waste reduction is connected with lead-time reduction. Therefore, the interviewed managers explained that Lean was warmly welcomed because, at the same time, it allows a reduction in costs and time. Waiting-list time and patients' routing times also represent a political issue pursued by the Italian NHS and local governments, and they are linked to patient satisfaction.

Ultimately, it can be said that the strategic goals and benefits achieved are patient satisfaction, cost reduction and times reduction, even if times reduction can be seen as part of patient satisfaction.

Moreover, the interviewees said that their organizations achieved these goals in different periods and ways. For instance, in one hospital, they preferred to start TQM–Lean deployment slowly, first implementing the systems in just one department, whereas in the other two hospitals, they simultaneously launched TQM–Lean initiatives in the hospital as a whole. This was mainly because of the different approaches wanted by the different general managers. For instance, one of the three general managers believed that launching TQM–Lean at the beginning just in one department could minimize the risk of failure. Whereas the other general managers believed that the correct and faster approach was to implement TQM–Lean simultaneously in different departments. In any case, according to all the managers, interesting benefits were achieved after approximately one year.

Improving performances

All the 12 managers declared that through TQM–Lean tools, an interesting and measurable improvement in terms of process and service performances can be reached. The three hospitals used a similar performance measurement system (PMS) for

measuring the improvements introduced by TQM–Lean initiatives. In particular, the improved performances affected:

- *Patient satisfaction*: All the interviewed managers underlined that a reduction in lead time and waiting-list time inevitably increases patient satisfaction. According to four interviewed managers, an increase in patient satisfaction can be appreciated only after a while and not immediately after the launch of Lean initiatives.
- *Lead time*: This metric in particular is used for measuring the patient routing system in terms of time. Patients' routings are divided by typologies, and a patient's progress is tracked across different theaters, wards, outpatient clinics, diagnostic departments and so on, to understand where wastes and inefficiencies are.
- *Waiting-list time*: This metric calculates a patient's waiting time before accessing care or diagnostic processes. Waiting-list time can be considered part of the total lead time or something apart but in any case is bound to the patient routing system.
- *Errors*: Errors are measured with metrics such as complaints, infections, errors in treatment and diagnostics.
- *Inventory reduction*: All the managers declared that Lean initiatives led to a reduction in, and taking control over, the amount of drugs, disposables and other medical devices.

As one of the strategic goals is linked to cost reduction, the organization must achieve economic and financial benefits (Olgiati and Danovi, 2015; Panizzolo *et al.*, 2009). Indeed, all the interviewed managers agreed that TQM–Lean can also bring many economic and financial results. To be more specific, the managers listed several affected economic and financial performances that can be aggregated according to these metrics:

- the average cost of a patient's treatment, affected by shortening times;
- the average cost of inpatient management, affected by shortening times;
- cost of medical and surgical supplies, affected by reducing inventories;
- cost of capitalized or fixed assets, affected by increasing productivity and availability; and
- cost of repairs and maintenance on equipment and buildings, affected by improving maintenance.

Eight managers declared that TQM–Lean tools can increase productivity as well. This means that a single department and even the hospital as a whole can increase the number of health services provided to patients with a consequent increase in turnover and patient satisfaction. As they are public hospitals, turnover is usually linked to transfer of funds from the local regional government.

All the interviewed managers agreed that the economic and financial benefits are typically measured after several months or one fiscal year. These benefits are measured through monthly key performance indicators (KPIs) and consolidated in the balance sheet. However, ten managers also declared that it is not simple to measure the achieved improvement from an economic and financial point of view. At the end of TQM–Lean

initiatives, the team is able to evaluate benefits in terms of performances such as lead time, waiting-list time and clinical errors. However, it is difficult to exactly and immediately quantify, for example, the economic and financial impact of waiting list reduction. This seems related to the particular accounting system implemented by these Italian public hospitals. In fact, five interviewed managers argued that TQM–Lean needs a different accounting system for measuring day-by-day improvements.

Improvements for the hospital as a whole

According to all the managers, one of the most dangerous pitfalls when TQM–Lean is deployed in Italian public healthcare is the possibility of failing in a complete implementation. The majority of Italian public hospitals are structured and complex organizations with many departments and many heads within these units. As a consequence, a typical patient's routing often has to pass through different "companies" with their own senior managers and centers of power. The interviewed managers explained that it could become difficult to implement TQM–Lean in this particular situation. The keystone for succeeding is to get strong commitment. In an Italian public hospital, this means that sponsorship has to come from the general manager of the hospital or even from an external institution such as the healthcare department of the local government. Indeed, in Italy, public hospitals usually receive funds from the local regional government and, therefore, they are under the authority of the strategic political choices of the government. Regardless of this, commitment from top management is fundamental.

One important aspect of medical care is the extreme personalization depending on the patient and the kind of illness. According to 7 of the 12 interviewed managers, in these cases, it might be difficult to apply TQM–Lean tools. For instance, it is difficult to map all the processes within a patient's customized routing using value stream mapping (VSM). Problems are related to the lack of data and information in consideration of the scarce repeatability of the service. Times and processes can change for each patient; therefore, it is not so simple to draw the VSM. Indeed, according to Rother and Shook (1999), VSM is usually related to a product or service family where processes within the family are similar. Moreover, it is difficult to create specific standards for the particular care. Ahlstrom (2004) investigated this aspect in a comparison between the concepts of product and service.

Organizational benefits and obstacles

All the interviewed managers agreed that TQM–Lean can bring other improvements more linked to human resources. However, these kinds of benefits are usually difficult to measure. The interviewed managers listed improvements concerning:

- involvement and awareness of the staff on the decision-making process;
- motivation;
- empowerment and self-responsibility;
- group identity;
- communication among departments; and
- team working.

However, the managers underlined that some of these issues when not successfully managed can change from improvements into obstacles and pitfalls. According to all the interviewed managers, TQM–Lean tools and principles are simple and well-comprehended by the staff. However, talking about comprehension, all the interviewed managers underlined the importance of a deep training at all levels at the beginning of the journey. Not only do you need to train team members on these tools and how to apply them but you also need to train all the staff to raise awareness of TQM–Lean principles. According to six interviewed managers, some physicians and nurses can perceive the project to be something forced on them if they were not involved in some way; undoubtedly, training is as an important means of becoming involved. According to 10 out of 12 interviewed managers, senior managers, such as the heads of departments, have to be committed to team building and promoting team effort. These very important issues cannot be delegated to other employees or, even worse, to external professionals such as consultants. One of the interviewed managers declared that in the past he had made such a mistake by completely delegating team-building activities to a consultant; in this way, the staff believed that the project was not so important for their senior manager, and the result was a lack of involvement.

TQM–Lean manufacturing approach and culture

The answers of the majority of the interviewed managers showed agreement on the view that TQM–Lean can be perceived by the organization as something specific for the manufacturing industry. They said that with some particular adaptations, TQM–Lean deployment, from a cultural point of view, usually is not a problem. But what are these particular adaptations?

First of all seven managers suggested that especially during the initial launch and communication, references to production systems such as the Toyota Production System should be avoided. Indeed, physicians and nurses could undergo a natural rejection of the system and perceive it to be completely unsuitable for healthcare. In this way, it is fundamental to avoid manufacturing examples during the staff's training but to try instead to adapt tools and principles to healthcare processes. Moreover, 11 interviewed managers confirmed that the terminology has to be appropriate to healthcare, avoiding terms such as defect and product that come from manufacturing.

Another important cultural issue is linked to the economic and financial performances. According to eight interviewed managers, a TQM–Lean strategy for public healthcare should not be fostered as an aggressive system for cutting costs like in the private industry. In this scenario, the strategy could be perceived as a sort of battle axe for making people redundant or increasing their workload. In addition, in this scenario, unions could try to stop the implementation.

TQM–Lean tools

All the interviewed managers argued that not all the tools can be used in public healthcare. According to ten managers, VSM, A3 problem solving, 5S, SMED, TPM and Kanban are the most important ones.

The managers stated that VSM is fundamental for seeing the waste within the processes, and it should be kept updated over time to evaluate whether waste, and consequently lead time, is decreasing or not.

According to all the managers, when operating theaters are involved, one of the most important tools to be utilized for reducing lead times is SMED. Furthermore, all the managers consider 5S to be a basic and fundamental tool for introducing visual management concepts and the so-called standard work.

Five out of 12 managers are trying to also implement TPM to improve maintenance. Notwithstanding in the manufacturing industry, where there is a high involvement of operators, in public hospitals, they prefer to manage maintenance using external professional or clinical engineers. Medical machines are considered too complex; moreover, according to the collective agreement of Italian public healthcare, it is not easy to make a nurse maintain medical machines. In fact, Italian collective agreements usually lead toward a strict job specialization.

Tools such as A3 problem solving and 5S can affect the results in terms of errors. However, six managers argued that TQM–Lean tools are not as effective as other tools derived from risk management for avoiding errors such as infections. Reducing infections requires use of advanced tools often based on statistical data analysis. These particular tools do not belong to the TQM–Lean environment.

Finally, all the managers are trying to implement Kanban signal for reducing and taking under control the amount of drugs, disposables and other medical devices. Kanban is important for reducing inventories within the pharmacy department as well as within each department.

The deployment path, benefits and pitfalls

After analyzing the information gathered from the interviews and combining it, we are able to propose a deployment path for TQM–Lean strategy implementation, which emerges from the case studies of three Italian large public hospitals. The path is shown in Figure 1 and, according to the interviewed managers, starts with a strong commitment from an enlightened and visionary top management as well as with full support from the health department of the local government. TQM–Lean strategy has to be shared among senior managers such as the heads of departments because this is the fundamental key to involving the entire hospital. This is strictly necessary because of the cross-departmental nature of patient routing systems. Top managers have also to appoint some specialists who are the internal consultants concerning tools and principles. The main strategic objectives usually declared in the business plan are linked to patient satisfaction. Cost reduction has to be achieved with no detriment to patient satisfaction. The objectives and the deployment path are then communicated to all the staff and departments. Furthermore, the staff has to be trained and involved to increase its awareness of TQM–Lean.

At this point, the more operative part of the deployment is implemented by mapping routings and processes through the VSM tool for finding all the waste. Kaizen initiatives based on tools such as 5S, A3 problem solving, SMED, TPM and Kanban lead to improvement in the KPIs related to the strategic objectives, and they are measured by a specific PMS.

From the interviewed managers, we also collected and grouped information concerning the achieved benefits and the encountered pitfalls during the TQM–Lean strategy journey. Table II summarizes the benefits and the pitfalls linked to the three large Italian public hospitals.

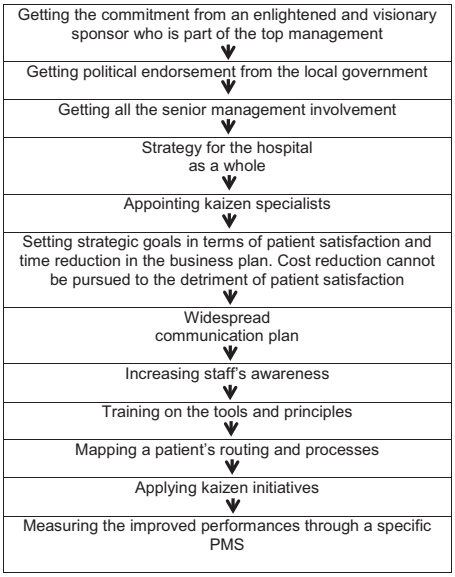

Figure 1.
The deployment path for TQM–Lean strategy

Benefits	Pitfalls
Increase in patient satisfaction	Lack of senior and top management commitment
Patients' routing time reduction	Lack of political endorsement
Waiting list time reduction	Difficulties in measuring financial improvements
Economic and financial improvements	Incomplete involvement and awareness of staff
Errors reduction	Perception of typical manufacturing strategy
Inventory reduction	Perception of an aggressive cost-reduction strategy
Increase of motivation and self-responsibility	Ineffective internal communication
Group identity and team building	Not all the tools suitable for healthcare
Increase in internal communication	Patients' routings are not standardized
	Strict and specialized collective agreement roles

Table II.
Achieved benefits and potential pitfalls

It can be noted that the benefits achieved are also linked to organizational performances. However, in the second column of Table II, we find pitfalls which can impede, if not well-managed, the achievement of the benefits. It can be underlined that the pitfalls can be all classified into an organizational and cultural field.

From the interviews, we also deduce some suggestions to mitigate some potential pitfalls that could appear. In particular, many suggestions linked to people involvement and lack of senior management involvement are well-known from prior literature. Other new and relevant suggestions lead the interviewed managers toward creating an appropriate terminology and culture for public healthcare. For instance, it is important to avoid terms that come from the manufacturing industry and not to promote TQM–Lean as an aggressive system for cutting costs like in the private sector. Moreover, according to some managers, using particular accounting systems for measuring the

benefits from an economic and financial point of view can also help to better motivate people, thus instilling a culture of continuous improvement.

Conclusions

In this research, we interviewed 12 managers of three Italian large public hospitals. The results of this research show that there is a specific deployment path for implementing TQM–Lean strategy which starts with a strong commitment and involvement of top and senior managers and an external political endorsement. Strategic objectives are connected first of all to patient satisfaction and then to cost and time reduction. Kaizen initiatives are managed by training and increasing the awareness of all the staff; the strategy deployment should involve the hospital as a whole. Not all the traditional TQM–Lean tools seem implementable in public healthcare. The three Italian hospitals much prefer VSM, A3 problem solving, 5S, SMED, TPM and Kanban. Besides, they consider that there are other more effective tools for reducing errors. The specific deployment path represents a novelty in the literature dedicated to public healthcare, and in particular to the integration of TQM and Lean.

These three Italian case studies also demonstrated how TQM–Lean strategy can improve performances such as times, inventories and productivity. However, it seems that not all the economic and financial benefits are that easy to quantify, especially in the short term. This is because of a particular lack in the accounting system.

TQM–Lean also has a positive effect on organizational performances such as motivation, communication and team building.

However, when a public hospital implements TQM–Lean production, there are also several pitfalls in ambush. The most important one is the commitment from top managers. A public hospital usually has many departments with many managers; therefore, it is important to align strategies within all the departments, which can only be done by top managers.

Other important pitfalls are related to staff's involvement and training aspects. For instance, training and terminology are important vehicles for getting the right involvement of all the staff; otherwise staff can perceive the TQM–Lean journey to be something forced on them or worse perceive it to be something only applicable to the private manufacturing industry.

At the end of this research, we can claim that some results confirmed what other authors had previously discussed. In particular, issues linked to the importance of internal sponsors, political sponsors, consistent communication, training and people involvement. Even so, several new issues have come out from this research; apart from the specific deployment path, issues such as the importance of some tools in respect to others, VSM implementation which is not repeatable for some patient's routing and difficulty in calculating the benefits through traditional accounting systems represent something that has never been investigated before.

There are some limitations in this research which led to the development of an agenda for further research. First, the research has been carried out in just three Italian public hospitals. Hence, similar investigations could be managed in other countries. Researchers could also use a larger sample and investigate these issues by means of quantitative inquiry.

Last but not least, practitioners could try to apply the deployment path revealed by these case studies in different public hospitals, especially non-Italian hospitals. They could also conduct a deeper investigation into what kinds of tools are actually fundamental to public healthcare.

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