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THESIS

POLICY DEPLOYMENT FOR CONTINUOUS IMPROVEMENT IN PUBLIC HOSPITALS

From Kaizen Initiatives to a Kaizen Initiative Program: an action research

CANDIDATE

Elisabetta Ocello

SUPERVISORS

Alberto Felice De Toni

Pietro Romano

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SUMMARY

According to scholars, a successful policy deployment is crucial to guarantee and sustain continuous improvement in public hospitals. However, the long-term perspective for kaizen in healthcare is still under investigation.

This study presents findings from an action research aimed at testing a theoretical framework adapted from the literature due to the launch and implementation of a policy deployment for continuous improvement. Such organizational change is investigated in an Italian regional healthcare system made up of seven public hospitals. Such hospitals experience the kaizen approach for the first time.

The study provides: 1) a Kaizen Initiative Program for policy deployment at both hospital and system level (e.g., regional/healthcare district); 2) key features for its successful launch (what) and their logical sequence for a successful implementation (when); 3) successful procedures (how) to properly select the kaizen teams and align kaizen initiatives to the hospital strategy. The tested framework is versatile and can be adapted to different healthcare contexts to support continuous improvement.

ABSTRACT

Purpose. Although kaizen methodology is increasingly applied and investigated in healthcare, most of the current literature describes successful kaizen initiatives and report their technical outcomes (e.g. Dickson et al., 2009; Laganga, 2011). Aspects related to the deployment of the kaizen approach across healthcare organizations are often neglected by the scholars. Thus, this thesis aims at filling this gap by developing and testing a theoretical framework to understand how the continuous improvement approach could be adopted and adapted to a public hospital and what features should be considered as key drivers of a successful implementation. In particular, this study uses a policy deployment perspective to investigate the linkage between decisions at the strategic level within healthcare organizations and those regarding the implementation of a set of kaizen initiatives over time (Kaizen Initiative Program – KIP).

Design/Methodology/Approach. This study uses the action research methodology to develop theoretical and practical insights from a complex endeavour as kaizen implementation in public hospitals. The research is divided in four main cycles: Design; Training; Kaizen (Implementation and Monitoring) and Evaluation. Each cycle includes: a pre-step for understanding context and purpose; a six main-step stage (to gather, feedback and analyse data, to plan, implement and evaluate actions) and a meta-step (to monitor) (Coughlan and Coghlan, 2002). The researcher played an active role and adopted the process consultation model to support the healthcare professionals engaged. Thus, the researcher could investigate in real time what characterized a continuous improvement program and how it has been deployed across the hospitals involved.

Findings. By investigating how the continuous improvement approach is implemented in public hospitals this study describes and discusses the practical problems addressed and difficulties emerging over time at both strategical and operational level, and at team and organisational level during the action research. In particular, this study provides: **1)** a tested framework for applying a KI Program at both organisational and system level (e.g., regional/healthcare district); **2)** the key features/practices of the KI Program (what) and their sequence for a successful implementation (when); **3)** the successful deployment modalities of the KI Program (how) to properly select the kaizen teams and initiatives

(e.g., the periodic briefings between the managers from the strategic level and the kaizen teams).

Practical implications. Results provide a structured framework for healthcare practitioners and managers who are interested in successfully launching and sustaining a KI Program. This framework could help hospital managers to link the strategic level decisions with continuous improvement actions at the operational level, avoiding the only use of bottom-up and pop-corn initiatives.

Originality. The research proposes a tested framework emerging from the action research for successfully selecting kaizen initiatives that are linked to the strategic objectives of healthcare organizations. Differently from the existing kaizen literature, this research engaged seven different and independent hospitals that have been performing their first kaizen experience simultaneously and which belong to the same regional healthcare system and are led by a unique regional administration office.

Keywords: continuous improvement, kaizen, hospital, kaizen program

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INTRODUCTION

Background

The healthcare service demand has deeply changed in the recent years: the ageing population continuously needs therapies and treatments appropriate to face multi-pathological and chronic diseases. Moreover, citizens are being much more aware of their rights and the expectations on care therapies are higher than before. On the other hand, public healthcare organisations are required to provide more services and more quality by managing financial resources in a constant reduction and respecting the governmental recommendations pushing to do more with less. In synthesis, the current challenge of the public healthcare system is to provide care quality and appropriateness through 1) the efficient and effective use of resources and 2) the observance of financial restrictions defined by governments. Since 1980's, different quality management methods have been applied in healthcare for facing these arduous requirements, as Quality Control and Assurance (Laffel and Blumenthal, 1989; Donabedian, 1992), Total Quality Management (Shortell et al., 1995) and Business Process Reengineering (Bertolini et al., 2011). The use of these approaches was influenced by concurrent contextual factors as the organisational culture, the environment requirements, the available resources and the personnel capabilities. Despite the managerial efforts recognized in the past decades, this critical issue has not been completely solved (Nicholas, 2012). For this reason, the lean approach has been introduced as an organisational and scientific approach for increasing the patient value by focusing on value-added activities and waste reduction. The achievement of this target needs the active and positive participation of the personnel. In 2001, it was introduced at the Virginia Mason Medical Center (Seattle) that was one of the healthcare pioneers learning from the manufacturing successful experiences. In fact, lean's origins are based in Toyota and it has been historically named as the "Toyota Production System". The Occidental version of lean management was introduced by Womack and Jones in 1990[1].

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[1] James P. Womack J.P., Jones D.T., Roos D., The Machine That Changed the World, Lean Enterprise Institute, Cambridge, 1990.

According to Shah and Ward (2007) we can define the lean production as an integrated and structured socio-technical mechanism aiming at eliminating waste by synchronously reducing both the internal and external variability (supply and costumers' processes). For transferring the concept of lean production in healthcare it is needed to deeply understand that this sector is highly political and complex, as defined by Radnor et al. (2012). It is also influenced by governmental normative and characterized by the work of powerful professionals.

Kaizen approach in healthcare

The existing body of knowledge (e.g. De Souza, 2009; Papadopoulos et al., 2011; Yusof et al., 2012) confirms that the key aspects of lean management, more suitable to the healthcare system, relate to the empowerment of staff and to the kaizen approach implementation for incremental continuous improvement of processes, firstly without any additional financial investment. In fact, kaizen consists in increasing the value for the patient by using a structured problem-solving mechanism and involving actively human resources for identifying, reducing and removing non-value adding activities. As Radnor et al. (2012) affirm, non-value adding activities in healthcare, and specifically in hospitals, refer to process duplication and redundant procedures (e.g. patient details recording in different departments or workplaces, length of stay, waiting time for patients, but also for personnel). According to Bortolotti et al. (2018), kaizen consists in conducting a structured continuous improvement project by a heterogeneous team (kaizen initiative). The aim is to achieve an improvement in a circumscribed process perimeter in a certain time range. Kaizen mechanism respects the three main aspects of lean management, as defined by Radnor et al. (2012): planning, improvement and performance monitoring.

Current healthcare literature and research purpose

The implementation of lean management in healthcare is a discussed topic among scholars, considering both the Managerial and the Medical Sciences (Costa and Filho, 2016; De Souza, 2009; Radnor et al., 2012). Focusing on the kaizen methodology application in hospitals, most of the current literature investigates the success of specific kaizen initiatives by comparing performances (quality, time, cost) before and after the

change intervention (e.g. Al Owad et al., 2013; Bahensky et al., 2005; Barnas, 2011; Carter et al., 2012; Ghosh and Sobek II, 2015; Iannettoni et al., 2011; Jacobson et al., 2009; Jimmerson et al., 2005; Johnson et al., 2012; Kimsey, 2010; Laganga, 2011; Leeuwen and Does, 2011). It seems that scholars still pay more attention to investigate how continuous improvement in healthcare could achieve technical outcomes (e.g. quality and productivity) and improve process performances. This could be a scientific trend because lean healthcare is a quite recent topic in literature (almost 20 years of studies starting from the Virginia Mason experience) compared to lean manufacturing (launched by Womack et al. in 1990[2]).

On the other hand, a scientific investigation on how to manage a corporate organisation based on continuous improvement is not evident in the healthcare literature. Therefore, it could be asserted that the discussion on policy deployment in hospitals focusing on kaizen is neglected by scholars. Moreover, the link of strategic management to operational management and vice versa is overlooked by the healthcare body of knowledge. According to Bessant and Francis (1999), policy deployment is defined as a level of organisational development characterized by 1) a clear communication of the strategic goals; 2) the achievement of strategic goals through improvement activities and 3) kaizen actions monitoring and measuring.

Thus, this thesis aims at filling this aforementioned gap by developing and testing a theoretical framework in order to understand how the kaizen approach could be adopted and adapted in public hospitals and what features should be considered. In particular, a structured linkage between the management strategy and the kaizen initiatives undertaking is investigated (policy deployment and governance). Action research is the methodology chosen for testing the theoretical framework, through the application of the process consultation model. Specifically, the subject of study is the organisational change occurred in seven Italian public hospitals belonging to the same Regional Healthcare System through the deployment of kaizen policy.

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[2] James P. Womack J.P., Jones D.T., Roos D., The Machine That Changed the World, Lean Enterprise Institute, Cambridge, 1990.

At the end, this study provides a tested framework with its features, practices and deployment modalities for successfully selecting kaizen initiatives linked to the strategic objectives of healthcare organizations.

A research model was designed for reaching the purpose of the research through a structured guidance, as presented in Figure 1.

Figure 0.1 Research Model
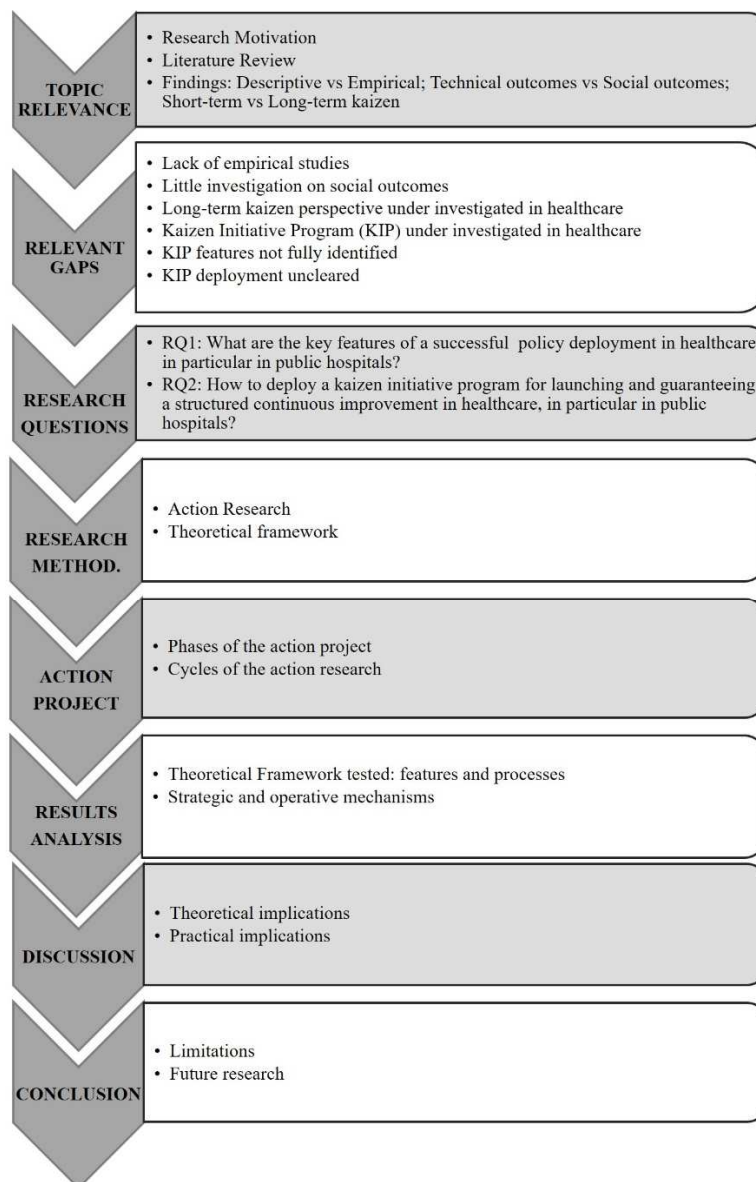
The research model starts with the identification of the research motivation and the classification of results found through the literature review of continuous improvement in healthcare (chapter 1). Relevant gaps related to the literature results are presented in chapter 2. The research questions and the originality of the study are explained in chapter 3. The research methodology chosen to target the research questions is described in chapter 4. Following, the theoretical framework adapted from the literature to be tested in the action project is delineated in chapter 5. The action project is described in chapter 6, presenting all its relevant transitions. The results analysis is reported in chapter 7. At the end, the discussion of the findings (chapter 8) and their relevance from the academic and managerial perspectives (chapter 9) are deeply explained. Limitations of the study and the future research are further outlined.

CHAPTER 1

LITERATURE REVIEW

Research Motivation

In recent years, the quality of healthcare has become a strong debated issue all over the world. We are observing a steadily aging demography, needing continuous medical assistance, and the consequent increase of chronic diseases instead of acute ones. Thus, the pressure on the healthcare sector in terms of quality and patient satisfaction is constantly increasing. On the other hand, public hospitals and healthcare national services in general should improve quality, increase service productivity, strenghten teamwork among professionals and reduce administrative and operational costs by managing financial resources in a constant reduction. In other words, public healthcare needs to become more efficient, effective and simultaneously to provide a good value for the patient.

Over the years, different process-oriented management approaches have been applied for facing this challenge, such as Quality Control and Assurance (Laffel and Blumenthal, 1989; Donabedian, 1992), Total Quality Management (Shortell et al., 1995) and Business Process Reengineering (Bertolini et al., 2011).

In the last 20 years, lean management has been introduced as an organisational and scientific approach for increasing the patient value by focusing on value-added activities and waste reduction. The first important implementation of Lean Healthcare happened in 2001 at the Virginia Mason Medical Center in Seattle (Washington). A few years later, other successful implementations were undertaken by Park Nicollet Health Background Services in Minneapolis and Thedacare in Wisconsin. The success of these implementations is well-known and documented by the scientific literature and the grey literature.[3] Thanks to these pioneers, the Continuous Improvement (CI) approach in healthcare has been increasingly applied by practitioners and investigated by scholars. In particular, both of them are still interested in practicing kaizen and in studying the

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

impact of CI in hospital settings. Such impact is mostly measured as a set of technical system outcomes (lead time, work in process inventory, productivity as defined by Kosandal and Farris, 2004). Although kaizen methodology is increasingly applied and investigated in healthcare, most of the current literature describes only the success of specific kaizen initiatives and reports their technical outcomes (e.g. Al Owad et al., 2013; Bahensky et al., 2005; Barnas, 2011; Carter et al., 2012; Ghosh and Sobek II, 2015; Iannettoni et al., 2011; Jacobson et al., 2009; Jimmerson et al., 2005; Johnson et al., 2012; Kimsey, 2010; Laganga, 2011; Leeuwen and Does, 2011). Aspects related to kaizen approach deployment across healthcare organizations are often neglected by scholars. In order to understand the fil rouge of the research, it is necessary to focus on the keywords guiding the study and the literature review (listed below with their specific definition in Table 1.1):

Table 1.1 Key words guiding the fil rouge of the research

KEY WORD	DEFINITION	REFERENCE
Lean Healthcare Management	developing a hospital culture characterized by increased (patient and employee) satisfaction through continuous improvements, in which all employees actively participate in identifying and reducing non-value adding activities.	Dahlgaard et al. (2011)
Continuous Improvement (CI) Approach	As an organisation-wide evolutionary learning process. Improvement evolution across the organisation, from local to organisation wide and from operational to strategic.	Bessant and Francis (1999)
Hoshin Kanri	A form of corporate-wide management that combines strategic management and operational management by linking the achievement of top management goals with daily operations.	Witcher and Butterworth (2001)
Policy Deployment	As linkage among local and project level activities to broader strategic goals; includes a clear strategic focus for CI activities. A level of development in which strategic goals are communicated and deployed and where improvement activity is guided by a process of monitoring and measurement against these strategic objectives.	Bessant and Francis (1999)
Kaizen Initiative	Defined as a structured project performed by a multi-disciplinary team aiming to improve a focused work area or process in a given timeframe.	Bortolotti et al. (2018)
Kaizen Program	Enabling continuous improvement when Kaizen events are systematically used to introduce rapid change in targeted work areas, often relying on lean work system principles.	Van Aken et al. (2010)
Technical outcomes	Lead time, work in process inventory, productivity. [1] Quantifiable metrics (Key Performance Indicators) which reflect the performance of an organization in achieving its goals and objectives. [2]	[1]Kosandal and Farris (2004) [2]Bauer (2004)
Social outcomes	Social outcomes are composed of two dimensions: the problem-solving capabilities of employees and the attitude. The latter measured considering the level of enthusiasm, the level of desire and the comfort to work in a team.	Bortolotti et al. (2018)

	Defined as a mindset that binds and individual to a course of action deemed necessary for the successful implementation of a change initiative. This mindset can reflect: **(a)** a desire to provide support for the change based on a belief in its inherent benefits (affective commitment to change); **(b)** a recognition that there are costs associated with failure to provide support for the change (continuance commitment to change) and **(c)** a sense of obligation to provide support for the change (normative commitment to change).	Herscovitch and Meyer (2002)
Commitment to change		

Methodology

The starting point of the research is a literature review for identifying the relevance of the topic chosen, the existing knowledge and its limitations. For guaranteeing a proper selection and review of scientific papers facing continuous improvement in healthcare, an extensive search in two main databases (PubMed, Scopus) was conducted. Both Management sciences and Medical sciences has been considered as areas of competence. Conceptual boundaries and inclusion criteria for realizing the literature review are detailed as follows.

Conceptual boundaries and inclusion criteria

The overall concept leading the conduction of this study is the application of continuous improvement in healthcare settings. In particular, the implementation of the kaizen methodology in public hospitals is the guiding principle of this study.

Search terms used for guaranteeing a compliance with the conceptual boundaries are listed as follows: "continuous improvement", "lean healthcare", "healthcare", "hospital", "kaizen *" (* is for including all the terminologies starting with kaizen, e.g. initiative; kaizen event). Papers facing the application of lean management in healthcare using the kaizen or continuous improvement methodology were included in the literature analysis. Papers focusing only on lean management in healthcare without mentioning the practice of kaizen initiatives or events have been excluded.

Based on the conceptual boundaries, the literature review was conducted by respecting specific selection criteria: 1) Area of competence; 2) Selection of academic journals; 3) Timeframe covered; 4) Selection of academic papers.

1) Area of competence

Whereas the topic considered involves both managerial and medical perspectives, for appropriately selecting papers, both management sciences and medical sciences have been considered as correct areas of competence. For this reason, as introduced before, an extensive search in two main databases (PubMed, Scopus) has been conducted.

2) Selection of Academic Journals

English writing and peer- reviewed journals were considered. Therefore, the grey literature (books, book chapters, conference proceedings and work-in-progress articles) was excluded because it is not index-linked and not peer-reviewed.

Academic journals belonging to management sciences were selected considering the classification procedure defined by AiIG (Associazione Italiana Ingegneria Gestionale) for the academic year 2017/2018[4]. Particular attention was paid to papers published in GOLD or GOLDSTAR Journals.

All the Academic Journals belonging to the medical community were considered if:

- classified as GOLD and GOLDSTAR Journals in the updated AiIG classification;
- not considered in the updated AiIG classification.

3) Timeframe covered

This criterion regards the period covered for realizing the literature analysis. Researcher decided to consider a timeframe of 13 years from 2005 to 2018 included. This is an appropriate range for understanding the topic and the trend of its investigation by and among authors, in a good and deepen manner. In fact, kaizen application in healthcare is a quite recent topic of research.

4) Selection of academic papers

[4] AiIG Classification of relevant Journals: https://www.ingegneriagestionale.it/wp-content/uploads/2018/04/riviste-aiig-aprile-2018-post-revisione.pdf

Firstly, papers have been included in the literature analysis after reading their abstracts. Secondly, papers were selected due to the "Article Title, Abstract, Key words" search modality using the following terminologies: "continuous improvement", "lean healthcare", "healthcare", "hospital", "kaizen *".

Papers facing the application of lean management in healthcare using the kaizen or continuous improvement methodology were included in the literature analysis. Papers focusing only on lean management in healthcare with any mentioning about the practice of kaizen (neither in their abstract nor in the full-text) have been excluded.

Thirdly, 35 papers (Table 1.2) were selected, read and analysed in relation to the mention or the absence of these additional key words: hoshin kanri, kaizen event or synonymous, kaizen program, policy deployment, technical outcomes, social outcomes, commitment to change.

Fourthly, papers were read, analysed and collected in a Microsoft Excel database, by considering the following variables of research:

- *Authors*: surname of the researchers;
- *Year of publication*;
- *Title of the Academic Journal* in which the paper is published;
- *Area of competence of the Journal*: Medical Sciences or Managerial Sciences,
- *Typology of the study*: descriptive or empirical. A paper is defined as a descriptive study if any methodology is clearly explained. A paper is defined as an empirical study if a methodology (case study, qualitative or quantitative analysis, action research, survey, etc) is specified for conducting the research;
- *Unit of the study*: denomination of the kaizen methodology, as specified in Table 1.3 and collected in Table 1.4;
- *Setting*, as the context in which the continuous improvement is tested;
- *Department or process specified*: if authors specified the typology of process analysed or the Department involved.

Literature review: preliminary results

Thanks to a preliminary analysis, first insights have been pointed out:

1) there is a greater presence of descriptive studies respect to empirical studies (as alphabetically listed in Table 1.2);
2) authors name differently the *kaizen event* as their unit of study, as listed in Table 1.3 and summarized in Table 1.4:

Table 1.2 Literature Review: papers selected

N°	Authors	Year	Journal	Area of competence	Descriptive/ Empirical
1	Al Owad et al.	2013	Advanced Materials Research	Managerial Sciences	Empirical (action research)
2	Atkinson and Mukaetova-Ladinska	2011	Journal of Psychosomatic Research	Medical Sciences	Descriptive
3	Bahensky et al.	2005	Journal of Healthcare Information Management	Medical Sciences	Descriptive
4	Barnas	2011	The Joint Commission Journal on Quality and Patient Safety	Medical Sciences	Descriptive
5	Bortolotti et al.	2018	International Journal of Operations & Production Management	Managerial Sciences	Empirical (case study)
6	Carter et al.	2012	Official Journal of the Society for Academic Emergency Medicine	Medical Sciences	Descriptive
7	Casey et al.	2009	Nature Clinical Practice	Medical Sciences	Descriptive
8	Dickson et al.	2009	Health Policy and Clinical Practice/Original Research	Medical Sciences	Descriptive
9	Dickson et al.	2009	The Journal of Emergency Medicine	Medical Sciences	Descriptive
10	Ghosh and Sobek II	2015	Journal of Health Organization and Management	Medical Sciences	Empirical (case study)
11	Iannettoni et al.	2011	The Annals of Thoracic Surgeons	Medical Sciences	Descriptive
12	Jacobson et al.	2009	Official Journal of the Society for Academic Emergency Medicine	Medical Sciences	Descriptive
13	Jimmerson et al.	2005	The Joint Commission Journal on Quality and Patient Safety	Medical Sciences	Descriptive
14	Johnson et al.	2012	Nursing Administration Quarterly	Medical Sciences	Descriptive

15	Kimsey	2010	AORN (Association of periOperative Registered Nurses) Journal	Medical Sciences	Descriptive
16	Laganga	2011	Journal of Operations Management	Managerial Sciences	Empirical (action research)
17	Leeuwen and Does	2011	Quality Engineering	Managerial Sciences	Descriptive
18	Martin et al.	2009	Journal of Nursing Care Quality	Medical Sciences	Descriptive
18	Mazzocato et al.	2016	BMJ Open	Medical Sciences	Empirical (qualitative analysis)
20	Melanson et al.	2009	American Journal for Clinical Pathology	Medical Sciences	Descriptive
21	Naik et al.	2011	Journal for Healthcare Quality	Medical Sciences	Descriptive
22	Natale et al.	2014	International Journal of Collaborative Enterprise	Managerial Sciences	Empirical (case study)
23	Ng et al.	2010	Canadian Journal of Emergency Medicine	Medical Sciences	Descriptive
24	Nicholas	2012	Hospital Topics: Research and Perspectives on Healthcare	Medical Sciences	Descriptive
25	Papadopoulos	2011	Leadership in Health Services	Managerial Sciences	Empirical (case study)
26	Papadopoulos et al.	2011	International Journal of Operations & Production Management	Managerial Sciences	Empirical (case study)
27	Rico and Jagwani	2013	European Journal of Hospital Pharmacy	Medical Sciences	Descriptive
28	Simon and Canacari	2012	AORN Journal	Medical Sciences	Descriptive
29	Smith et al.	2012	Journal of Public Management Practice	Medical Sciences	Descriptive
30	Stelson et al.	2017	International Journal of Health Care Quality Assurance	Managerial Sciences	Empirical (survey)
31	Stonemetz et al.	2011	Anesthesiology Clinics	Medical Sciences	Descriptive
32	Tetteh	2012	AORN Journal	Medical Sciences	Descriptive
33	Waldhausen et al.	2010	Journal of Pediatric Surgery	Medical Sciences	Descriptive
34	Wennecke	2008	Medical Laboratory Observer	Medical Sciences	Descriptive
35	Yusof et al.	2012	BMC Medical Informatics and Decision Making	Managerial Sciences	Empirical (case study)

From the literature analysis it also emerged that kaizen events (even if named in different ways) have a clear definition as individual short-term initiatives addressed to make continuous quality improvements without massive expenditures (Bahensky, 2005). Continuous improvement as a managerial approach for doing better with less efforts

(related to the reduction of the seven typologies of waste) is a consolidated concept among practitioners and scholars.

Moreover, kaizen approach is an attractive method for generating, implementing, and sustaining improvement ideas (Natale et al., 2014). Such attractiveness is proved by several factors. Firstly, the improvement has to be launched and sustained by internal staff, both at strategic and operative level. Secondly, the improvement is based on a cyclical and structured analysis process, named PDCA or Cycle of Deming. Thirdly, the improvement needs to be applied and sustained with resources available in the organization.

Table 1.3 Denomination of the unit of study per each paper reviewed

N°	Authors	Year	Unit of Study	Setting	Department/ Process specified
1	Al Owad et al.	2013	Process Improvement	Hospital	Emergency Department
2	Atkinson and Mukaetova-Ladinska	2011	5-day rapid progress improvement workshop event	Hospital	Nurse-led liaison service
3	Bahensky et al.	2005	5-day kaizen event	Hospital	Computerized Tomography Scanning processes
4	Barnas	2011	Rapid improvement event	Hospital	Different processes: Obstetrics, Radiation Oncology, Surgical Unit
5	Bortolotti et al.	2018	Kaizen Initiative	Hospital	Organisation level
6	Carter et al.	2012	3-week Lean Improvement Program	Hospital	Hospital admissions process
7	Casey et al.	2009	Kaizen event	Hospital	urology process – Ambulatory clinic
8	Dickson et al.	2009	Kaizen event	Hospital	Emergency Departments
9	Dickson et al.	2009	Kaizen event	Hospital	Emergency Departments
10	Ghosh and Sobek II	2015	Process Improvement	Hospital	Process from Specimen collection in Operating Rooms to Laboratory
11	Iannettoni et al.	2011	Kaizen Methodology	Hospital	Esophagectomy process
12	Jacobson et al.	2009	Kaizen initiative	Hospital	Emergency Departments
13	Jimmerson et al.	2005	pilot project for continuous improvement	Hospital	Transversal process among different areas
14	Johnson et al.	2012	Kaizen Initiative	Hospital	Emergency Department and Operating Room
15	Kimsey	2010	RIE Rapid Improvement Event	Hospital	Central sterile processing department
16	Laganga	2011	RICE Rapid Improvement	Outpatient Clinic	Service Scheduling and Delivery process

				Capacity Expansion
17	Leeuwen and Does	2011	Continuous Improvement - DMAIC process	Hospital	Orthopaedic Patient's length of stay
18	Martin et al.	2009	RIE Rapid Improvement Event	a) Hospital, b) Clinic and c) Cancer Center	a) Emergency Department- Radiology and Laboratory b) Service process; Outpatient Clinic Process; c) inpatient to ambulatory service process
19	Mazzocato et al.	2016	Kaizen Event	Hospital	186 Kaizen Documents
20	Melanson et al.	2009	Kaizen Event	Hospital	Outpatient phlebotomy process
21	Naik et al.	2011	RIE Rapid Improvement Event	Hospital	Emergency Department
22	Natale et al.	2014	Kaizen Event	Hospital	n. 3 cases of patient discharge flow in: Medical Telemetry; Care Unit; Emergency Department
23	Ng et al.	2010	Kaizen Workshop	Hospital	Emergency Department
24	Nicholas	2012	Kaizen Event	Hospital	Emergency Department
25	Papadopoulos	2011	RIE Rapid Improvement Event	Hospital	Pathology Unit
26	Papadopoulos et al.	2011	RIE Rapid Improvement Event	Hospital	Pathology Unit
27	Rico and Jagwani	2013	Kaizen Event	Hospital	Pharmacy Department
28	Simon and Canacari	2012	RIE Rapid Improvement Event	Deaconess medical center	Surgery Ambulatory Process
29	Smith et al.	2012	RIE Rapid Improvement Event	Home Health and Hospice Agency	Home nursing care and therapy process
30	Stelson et al.	2017	Continuous Improvement Project	Hospital	Organisation level
31	Stonemetz et al.	2011	Process improvement	Academic Medical Center	Regulated Medical Waste in Surgery
32	Tetteh	2012	kaizen process improvement model	Hospital	Perioperative process
33	Waldhausen et al.	2010	kaizen process improvement model	Surgical Clinic	Patient discharge from surgery clinic process
34	Wennecke	2008	Kaizen Event	Hospital	Gynaecological pre- intervention process (waiting list)
35	Yusof et al.	2012	Improvement Project	Hospital	Anaesthesia Department (pre- Anaesthesia process)

Table 1.1.4 Number of papers of papers referred to as "kaizen event"

Denomination	No. papers	Authors
Kaizen event	10	Bahensky et al., 2005; Wennecke, 2008; Casey et al., 2009; Dickson et al., 2009; Dickson et al., 2009; Melanson et al., 2009; Nicholas et al., 2012; Rico et al., 2013; Mazzocato et al., 2016; Natale et al., 2014
RIE Rapid Improvement Event	8	Martin et al., 2009; Kimsey et al., 2010; Barnas et al., 2011; Naik et al. 2011; Papadopoulos, 2011; Papadopoulos et al., 2011; Simon et al., 2012; Smith et al., 2012
Process Improvement	3	Alowad et al., 2014; Ghosh et al., 2015; Stonemetz et al., 2011
Kaizen Initiative	3	Jacobson et al., 2009; Johnson et al., 2012; Bortolotti et al., 2018
RPIW Rapid Progress Improvement Workshop Event	2	Atkinson et al., 2012; Waldhausen et al., 2010
Pilot Project for Continuous Improvement	1	Jimmerson et al., 2005
Continuous Improvement - DMAIC process	1	Leeuwen et al., 2011
Improvement Project	1	Yusof et al., 2012
Continuous Improvement Project	1	Stelson et al., 2017
Kaizen workshop	1	Ng et al., 2010
Kaizen method	1	Iannettoni et. Al, 2011
Kaizen Process Improvement Model	1	Tetteh et al., 2012
3-week Lean Improvement Program	1	Carter et al., 2012
RICE Rapid Improvement Capacity Expansion,	1	Laganga et al., 2011
TOTAL	**35**	

Another aspect emerged from the literature review is that scholars are almost investigating on kaizen events in hospital settings as short-term initiatives following a clear kaizen event framework supported by lean principles. According to Bahensky et al. (2005), Kaizen seeks quality within the process structure of an organization, aiming to enhance the achievement of incremental improvement. Moreover, 30 out of 35 reviewed papers (86%) focus on the hospital setting, investigating especially Emergency Departments (10 out of 30/ 33%).

Literature review: the three main categories of results

The preliminary insights obtained by the literature analysis represent the basis for discussing different aspects of continuous improvement in the hospital setting, classified into three main categories by the researchers:

1. Descriptive studies vs. empirical studies;
2. Studies addressed to technical outcomes vs studies addressed to social outcomes;
3. Studies focused on short-term kaizen experiences vs studies focused on long-term kaizen experiences

Figure 1.1 Findings found from the literature
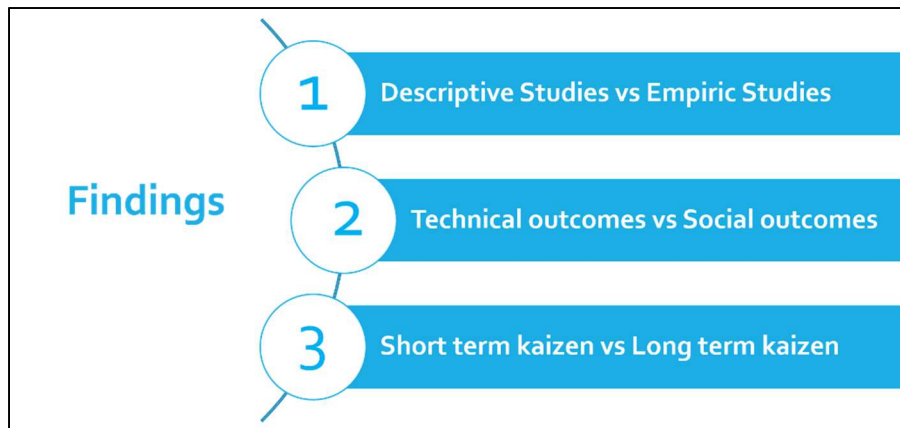
Descriptive studies vs empirical studies.

The reviewed papers can be classified into two first categories: *descriptive* and *empirical*. Among 35 selected papers, 25 are descriptive studies (71%). 10 out of 35 studies (29%) face empirically continuous improvement in the hospital setting, through case studies (Bortolotti et. Al., 2018; Papadopoulos, 2011; Papadopoulos et al., 2011; Yusof et al., 2012; Natale et al., 2014; Ghosh et al., 2015); qualitative analysis (Mazzocato et al., 2016; Stelson et al., 2017) and action research (Laganga et al., 2011; Alowad et al., 2014;) as methodology.

Descriptive studies pay attention to the sequence of activities for the kaizen approach implementation and focus on technical outcomes (quality, patient satisfaction, costs, time, reduction of waste).

Below, the Table 1.5 presents details on the terminology chosen by authors to describe the improvement methodology applied and the lean tools mentioned (not always specified).

Table 1.5 Methods and tools for continuous improvement

N°	Authors	Year	Improvement methodology applied	Tools used or mentioned
1	Al Owad et al.	2013	Six Sigma Methodology	VOC, A3-tool; VSM
2	Atkinson and Mukaetova-Ladinska	2011	A3 Process (PDCA)	A3 Report
3	Bahensky et al.	2005	Kaizen	Lean Sigma (Lean techniques + Six Sigma)
4	Barnas	2011	Kaizen	A3 Report; VSM, Fishbone analysis
5	Bortolotti et al.	2018	A3 Process (PDCA)	A3 Report
6	Carter et al.	2012	A3 Process (PDCA)	A3 Report with VSM; Root Case Analysis; 5Whys; Ishikawa fishbone
7	Casey et al.	2009	Kaizen	Heijunka; JIT inventory;
8	Dickson et al.	2009	Kaizen	
9	Dickson et al.	2009	Kaizen	VSM
10	Ghosh and Sobek II	2015	A3 Process (PDCA)	A3 Report
11	Iannettoni et al.	2011	Kaizen	-
12	Jacobson et al.	2009	Kaizen	-
13	Jimmerson et al.	2005	TPS Principles	A3 Report; VSM
14	Johnson et al.	2012	Lean Methodology	Current State Map; Future State Map; 5S
15	Kimsey	2010	A3 Process (PDCA)	A3 Report
16	Laganga	2011	A3 Process (PDCA)	-
17	Leeuwen and Does	2011	Lean Six Sigma (DMAIC)	DMAIC report
18	Martin et al.	2009	Rapid Improvement Approach	-
19	Mazzocato et al.	2016	Kaizen practice	Kaizen Template
20	Melanson et al.	2009	Kaizen (PDSA)	-
21	Naik et al.	2011	Kaizen	A3; Value Stream Analysis
22	Natale et al.	2014	Kaizen week	-
23	Ng et al.	2010	Kaizen	VSM;
24	Nicholas	2012	Lean Methods	VSM; 5S; VOC; Standard work
25	Papadopoulos	2011	CI (Continuous Improvement) Principles	-
26	Papadopoulos et al.	2011	Improvement process	-
27	Rico and Jagwani	2013	CI methodology	VSM;
28	Simon and Canacari	2012	A3 Process (PDCA)	Cause-and-effect diagram; Jidoka; poka-yoke; hoshin kanri; Activity Scorecar; Implementation Plan;
29	Smith et al.	2012	Kaizen and PDCA process	Gemba walk, 5S
30	Stelson et al.	2017	Continuous Improvement	A3 Report
31	Stonemetz et al.	2011	Lean Six Sigma (DMAIC)	DMAIC timeline
32	Tetteh	2012	Kaizen	Quality circles
33	Waldhausen et al.	2010	Lean Method	5S; Process Mapping
34	Wennecke	2008	Kaizen	Current State Analysis
35	Yusof et al.	2012	A3 Process	A3 report, VSM

Findings

It seems that there is still a lack of empirical studies investigating individual kaizen initiatives in healthcare, especially referring to medical sciences. A3 process and Kaizen

are the most frequent terminologies for presenting the improvement method used or described in the reviewed papers, as highlighted in the Figure n. 1.2. Continuous Improvement principles or methodology are the third mostly mentioned terminology.

Figure 1.2 Terminology mostly used by reviewed author
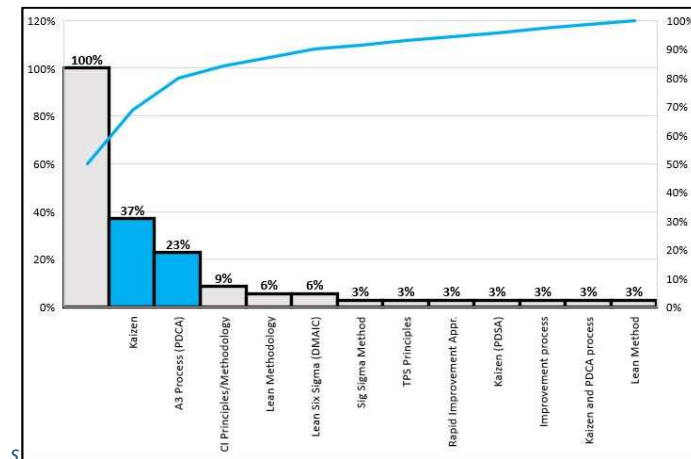
As illustrated in figure 1.3, lean tools as the A3-Tool/Report and the VSM - Value Stream Map are the mostly mentioned techniques used in healthcare.

Figure 1.3 Times in which techniques are mentioned in the reviewed papers
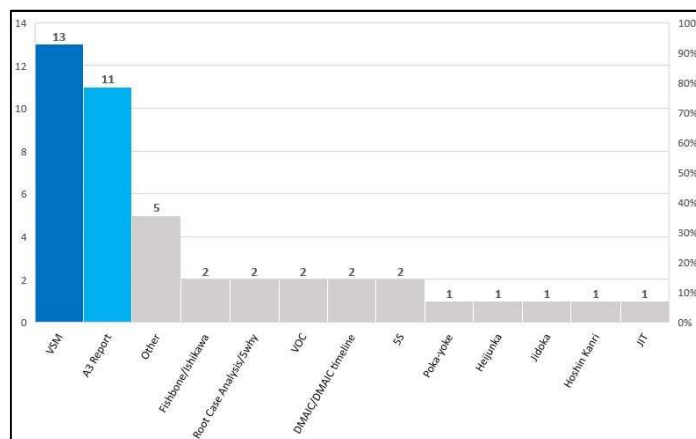
Technical outcomes vs Social outcomes

Technical outcomes include time, cost and quality performances. They can be defined as quantifiable metrics used for measuring the performances of an organisation in order to reach its own objectives. On the other hand, social outcomes are explained as problem solving capabilities and attitude to team work of professionals and operators involved in a kaizen project (Farris et al., 2009; Bortolotti et al., 2018).

Referring to these two main concepts, it is emerged that reviewed papers are addressed mainly to investigate technical outcomes as result from the action of kaizen events:

- 25 papers (71%) report technical outcomes reached by specific kaizen initiatives. 20 of them (80%) are descriptive studies. The residual 5 papers (20%) are empirical studies.
- 6 articles (17%) focus mainly on technical outcomes but paying a little attention to social outcomes. 5 of them are descriptive studies.
- 2 papers are specifically addressed to social outcomes, by using a qualitative analysis from a survey;

Exclusively 2 out of 35 papers investigate other topics of research such as actor networks in continuous improvement implementation (Papadopoulos, 2011) and complexity issues of continuous improvement in healthcare settings (Papadopoulos et al., 2011).

Findings

Scholars still tend to pay more attention to technical outcomes rather than social outcomes (scientific investigation at an early stage). In fact, 25 papers (71%) describe and investigate short-term kaizen events by focusing especially on the technical benefits in terms of costs, time and quality of the healthcare processes investigated. It is clear for scholars which are the technical outcomes: reduced costs and reduced waiting time; increased quality and increased patient satisfaction. On the contrary, it seems that social outcomes are still overlooked. Probably, this trend is justified by the request of objective results. Technical outcomes are quantitatively measurable and easy to define as performances. Social outcomes as commitment to organizational change, workers' satisfaction and work climate, depends on different variables that need to be identified,

defined, measured and finally reliable. Thus, they need more efforts to be measured in a qualitative and quantitative manner. Moreover, the application of kaizen methodology in healthcare is a recent topic of investigation and studies are mostly engaged in proving the success of the methodology itself.

Short-term kaizen experiences vs Long-term kaizen experiences

A relevant issue emerging from the literature review is that only 10 out of 35 papers (29%) start to contemplate the long-term perspective for continuous improvement in addition to the success of kaizen initiatives (short-term perspective). Specifically, these studies introduce a particular attention to the long-term vision for continuous improvement design in healthcare at strategy level, to be linked (policy deployment) with the operative level (kaizen implementation): Dickson et al., (2009), Jacobson et al. (2009); Ng et al. (2010), Waldhausen et al. (2010), Laganga et al. (2011), Leeuwen et al. (2011), Naik et al. (2011), Papadopoulos et al. (2011), De Souza et al. (2011), Yusof et al. (2012).

These scholars aim at discussing *what* a continuous improvement program should be in healthcare within a long-term perspective, but there is no universal solution for defining features which guarantee a long-term kaizen deployment. Moreover, it is not clear *how* this long-term perspective for continuous improvement should be planned and deployed in public hospitals.

Only 1 paper out of 39 is primarily addressed to long-term kaizen initiatives (Mazzocato et al., 2016): the authors face the issue on how the entire kaizen process relates to the overall organisational goals from the workers' perspective. Even if the setting of this study is a hospital the investigation faces a situation in which the kaizen methodology is already part of the organisational culture.

Extension of the literature review

As it emerged from the literature review, there has not been a reliable and structured contribute on designing and realizing a Kaizen Program in a healthcare setting. For this reason, the researcher has tried to enlarge the literature analysis considering sectors different from the health area. It merged that some authors seem to have provided a

coherent contribute in manufacturing and public sector in general (Van Aken et al., 2010; Glover et al., 2013) through case studies in which kaizen is a consolidated approach. Moreover, Bessant and Francis (1999) contribute to understand different and sequential levels of continuous improvement evolution in any organisation, from random problem-solving (Level 0) to the learning organisation (Level 5). Details on these three papers are listed below in Table 1.6.

Table 1.6 Empirical papers on kaizen program in sectors different from healthcare

Authors	Year	Journal	Area of competence	Descriptive /Empirical	Unit of Study	Setting
Van Aken et al.	2010	International Journal of Productivity and Performance Management	Managerial Sciences	Empirical (case study)	Kaizen Event Program	Defence industry organisation
Glover et al.	2013	International Journal of Operations & Production Management	Managerial Sciences	Empirical (qualitative study)	Kaizen Event Program	Manufacturing, Service and Government organisations
Bessant and Francis	1999	International Journal of Operations & Production Management	Managerial Sciences	Empirical (case study)	Policy deployment	Japan and Western enterprises

Findings

Summarizing, from the literature review it emerged that strategic continuous improvement guided by a policy deployment, which links kaizen level activities to the strategic goals of a healthcare organization is a crucial issue but still at an early stage of investigation.

By enlarging the literature research, it was found that some publications have given a scientific and managerial contribution on long-term kaizen deployment and proposed some Kaizen Event Program Framework (Van Aken et al., 2010; Glover et al, 2013) but only in the field of manufacturing and service industries. In fact, a common issue in the little literature (Van Aken et al., 2010; Glover et al., 2013) is how to guarantee the incremental improvement in any organization and what managerial tool could be designed and applied (a logical framework for kaizen program). To the best of our

knowledge, no studies present contribution on kaizen policy deployment in healthcare, in particular in public hospitals.

Despite the relevance of policy deployment for systematic improvement of kaizen initiatives (as structured long-term perspective at systemic level enhancing short-term operational perspective), it seems that there is a lack of systemic and empirical-based guidance on how to address policy deployment for continuous improvement. Moreover, this gap is particularly emphasized in healthcare literature.

. RELEVANT GAPS

The literature review explained in the previous chapter aimed at bringing gaps out from the scientific literature, concerning kaizen methodology application in healthcare. The following issues have been identified on the 35 papers selected and reviewed:

1. Descriptive studies vs Empirical studies
2. Technical outcomes vs Social outcomes;
3. Short-term kaizen experiences vs Long-term kaizen experiences.

Considering these three main topics, gaps from literature were recognized, as illustrated in the Figure 2.1 below:

Figure 2.1 Relevant gaps in literature

Lack of empirical studies investigating kaizen initiatives in healthcare (1)

Kaizen methodology in healthcare is an inflated and discussed topic among scholars of managerial and medical sciences, but there is still little empirical literature. In fact, one of the main results on the literature review is the classification of studies in two different categories: narrative and empirical. Only 29% face empirically continuous improvement in healthcare settings. Among them, the methodology used is different: empirical studies are mainly based on case study methodology (7 papers: Bortolotti et al., 2018; Ghosh and Sobek II, 2015; Natale et al., 2014; Papadopoulos, 2011; Papadopoulos et al., 2011; Stelson et al., 2017; Yusof et al., 2012;). Thus, a qualitative analysis (Mazzocato et al., 2016) and two cases of action research (Alowad et al., 2014; Laganga et al., 2011;) were identified.

The total number of narrative papers (27 out of 39) is published on medical sciences journals. These papers are not empirical because their aim is to emphasize the lean experience success in healthcare by focusing on the achievement of technical results due to the kaizen methodology. No empirical methodologies are applied, but practical results from the field are described. In fact, any research protocol is specified in these articles, nor in the abstract neither in the full-text. Moreover, these studies are published by physicians or researchers specialised in medical sciences and aim at confirming the success of lean implementation through the kaizen approach application in healthcare. However, these studies are extremely useful to describe tools and techniques mostly applied during the kaizen initiatives in hospitals or healthcare organisations.

On the other hand, the little empirical literature provides a scientific contribution on specific kaizen initiatives, but the experience of hospitals involved in approaching continuous improvement is not always clearly expressed. Authors that provide this information are listed and synthetized below:

- Bortolotti et al. (2018) compare two hospitals with a consolidated kaizen experience at organisational level
- Laganga (2011) expresses clearly that the research in action concerns the first lean process improvement process of the organisation investigated.
- Mazzocato et al. (2016) clearly discuss the case of a Swedish hospital experiencing kaizen as a consolidated methodology.

- Papadopoulos et al. (2011) discuss clearly the first promotion of Lean Thinking for process performance improvements.
- Papadopoulos (2011) discusses the Continuous Improvement Mechanism in the English National Health Service. It seems that the kaizen experience is consolidated in the hospital examined by the authors.
- Stelson et al. (2017) investigate factors to guarantee CI in healthcare. It seems the paper focus on contexts with a consolidated experience in continuous improvement.

Differently, Al Owad et al. (2013), Ghosh and Sobek II (2015), Yusof et al. (2012), Natale et al. (2014) do not explicate the level of experience in continuous improvement.

Filling the gap: relevance of the academic contribute

This thesis contributes to fill the literature gap by proposing an empirical study on kaizen initiatives in public hospital, pointing out outcomes (technical and social) from the field. This study involves seven different hospitals belonging to the same regional healthcare system. Moreover, this study provides implications established through an action research, differently from most of papers using the case study methodology. The action research methodology contributes both to trace the development at organisational and team level and to overcome the limitations of the existing literature regarding:

- the lack of empirical studies;
- the lack of action research methodology about the kaizen approach in hospitals;
- the lack of observation on change development in healthcare through the policy deployment;
- the lack of investigation on first experiences in healthcare adopting a kaizen structured framework.

Filling the gap: relevance of the managerial contribute

From a managerial point of view, the research aims at providing reliable results from the empirical practice, in order to provide robust guidelines to practitioners willing to adopt

the kaizen methodology in healthcare effectively from the very beginning. In fact, this research investigates a healthcare context experiencing the kaizen approach for the first time, through a scientific methodology. The study it is not limited to simply give more evidences of kaizen methodology efficacy from/to a practical perspective, but also:

- to introduce the kaizen methodology through a tested framework in seven hospitals;
- to guarantee a grounded linkage between strategy and operational levels to activate kaizen initiatives, from first implementation steps.

Little investigation on social outcomes in kaizen initiatives as outputs reached (2)

Among the reviewed papers on managerial and medical sciences, 25 of them (71%) report technical outcomes due to specific kaizen initiatives. Furthermore, authors officially announce the target reached: achieving a process efficiency through the kaizen methodology in a specific hospital or healthcare department.

Starting with a kaizen experience is a needed urgency for the majority of the cases analysed for this study (as listed in Table 2.1). In fact, it is clearly revealed that a deeply-rooted dilemma in healthcare organisation is how to reach waiting time reduction, service quality and therapy appropriateness by saving money and resources. In other words, how to reach a prompt and suitable therapy for patients in a good time with available resources (in lean jargon, resources defined in four categories: Man, Machine, Material, Methods). Therefore, scholars still pay more attention to investigate how continuous improvement in healthcare achieves technical outcomes and improves process performance. This could reveal a scientific trend because lean healthcare is quite a recent topic in literature (almost 20 years of studies starting from the Virginia Mason experience) respect to lean manufacturing (launched by Womack et al. in 1990[5]). Probably for these reasons, scientific investigation on social performances in healthcare is at an early stage.

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[5] James P. Womack J.P., Jones D.T., Roos D., The Machine That Changed the World, Lean Enterprise Institute, Cambridge, 1990.

Table 2.1: Constraints faced and motivation for the kaizen application

	Authors	D/E*	Constraint	Motivation
1	Al Owad et al. (2013)	E	*Increased competition between healthcare providers, higher customer expectations, new government regulations*	to enhance the quality of the care provided, to increase efficiency; to improve the cost effectiveness of the services
2	Atkinson and Mukaetova-Ladinska (2011)	D	*National guidelines setting the standard requirements for healthcare services*	Integrating assessment and treatment of mental disorder into routine general hospital practice
3	Bahensky et al. (2005)	D	*The Iowa Business Council sponsored an event to test the adaptability of using Lean Sigma concepts*	To improve the Radiology CT scanning process
4	Barnas (2001)	D	*Establishment of a strategic goal: increasing productivity by 10% annually.*	To daily sustain the improvement process
5	Bortolotti et al. (2018)	E	*The development of social outcomes is crucial for reaching technical results*	To identify the most influential determinants of employees' problem-solving capabilities in healthcare environments using kaizen methodology
6	Carter et al. 2012)	D	*Although many global health programs focus on providing clinical care or medical education, improving clinical operations can have a significant effect on patient care delivery, especially in health systems without high-level operations management*	To improve the Hospital admission process clinical operations in Ghana
7	Casey et al. (2009)	D	*Health-care systems are currently rife with challenges related to safety, quality and efficiency. The Institute of Medicine in the US has charged the medical community with the challenge of providing a safe health-care system: effective, patient-centred, timely, efficient and equitable*	There are high numbers of medical errors, health-care systems operate at a less than ideal level of efficiency
8	Dickson et al. (2009)	D	*The Institute of Medicine report on emergency care in the United States, warns of a looming crisis in emergency care. There is also a tacit recognition that EDs internal organisation often is a source of inefficiencies*	To increase the efficiency
9	Dickson et al. (2009)	D	*The Institute of Medicine called for a fundamental redesigning of America's health care system with focus on safety and quality*	Safety, Efficiency and Quality to be achieved
10	Ghosh and Sobek II (2015)	E	*To examine empirically why a systematic problem-solving routine can play an important role in the process improvement efforts of hospitals*	To analyse problem-solving routines (A3 process)
11	Iannettoni et al. (2011)	D	*The majority of costs associated with esophagectomy are related to the initial 3 days of hospital stay. The major cost increases are related to complications associated with the procedure*	To improve Esophagectomy patients flow
12	Jacobson et al. (2009)	D	*Recent position statements from healthcare organizations place a strong emphasis on continuous quality improvement. Emergency Department struggle to find ways to successfully implement CQI programs involving all physicians*	To improve the Emergency Department organisation
13	Jimmerson et al. (2005)	D	*Challenges of health care: increasing costs, complex regulatory environments, increasing error rates, labour shortages in key sectors, and the aging baby boomer population*	To determine whether and how the principles of TPS might apply to health care.
14	Johnson et al. (2012)	D	*Health care reform: new pressures on American hospitals forced to do more with less.*	Quality improvement efforts
15	Kimsey (2010)	D	*External influences as the current economic climate, reimbursement rates that are*	To deliver care in a patient-focused, value-added manner.

			increasing more slowly than expenses are rising, and an aging population in need of more services, are creating a complex situation in healthcare	
16	Laganga (2011)	E	*Service operations face the continuing challenge of matching consumer demand with provider supply. Timely access, responsiveness to patient needs and availability are high priorities among healthcare system improvements defined by the Institute of Medicine*	To reduce delays and missed appointments
17	Leeuwen and Does (2011)	D	*Complaints with respect to the management of health care and health care delivery are huge as the increased costs*	Cost reduction and efficiency
18	Martin et al. (2009)	D	*The Institute of Medicine Reports provided evidence that despite technological and scientific breakthroughs in medicine, healthcare delivery is still far below acceptable levels in terms of quality and patient safety*	To intensify efforts to improve the healthcare system and minimize the gap between current state and desired care delivery
19	Mazzocato et al. (2016)	E	*There is promising evidence that lean helps to improve efficiency and quality in the short-term. However, sustainability of results after the initial period of short-term gains has been proven difficult to achieve and there is only limited understanding of factors influencing variation in results across organisational settings*	To understand sustainability of kaizen practice in healthcare
20	Melanson et al. (2009)	D	*The health care system in the United States is frequently criticized for waste, inefficiency, and medical errors*	To improve workflow and capacity and increase patient and employee satisfaction
21	Naik et al. (2011)	D	*Emergency medicine sits at the forefront of the growing challenge faced by the nation's healthcare system to provide high-quality, safe, efficient care in a resource-constrained environment with increasing patient visits, higher acuity and aging populace*	To reach quality, safety and efficiency of care
22	Natale et al. (2014)	E	*Hospitals systems in the USA have faced challenges to deliver safe, effective, and efficient care in an environment which continues to grow increasingly complex. For meeting these challenges, hospitals must make a concerted effort to increase their efficiency*	To study three different kaizen event styles for improvement
23	Ng et al. (2010)	D	*Emergency department wait times have become a focus for the Canadian public, the media and the government*	Despite efforts (increasing resources: number of staff and triage stations) there was little appreciable impact on overall Emergency Department wait times.
24	Nicholas (2012)	D	*Application of lean production in healthcare has grown rapidly over the past decade.*	Proven in manufacturing, lean methods aimed at eliminating waste are being applied to increase efficiency, improve quality of care, and reduce costs
25	Papadopoulos (2011)	E	*There has been an unprecedented interest on behalf of governments, managers and clinicians alike into investments in deploying CI to improve clinical pathways by using various methods. Despite the interest, understanding is still limited*	To examine the implementation of lean thinking in healthcare
26	Papadopoulos et al. (2011)	E	*Over the past decade, the UK National Health Service has been characterised by a series of process improvement programmes*	To explore the dynamics of network emergence that give rise to the outcomes of process improvement interventions

			aimed at improving the efficiency and effectiveness of the delivery of healthcare	because the understanding is limited
27	Rico and Jagwani (2013)	D	*Healthcare institution faces the same situation: increasing numbers of patients treated and trying to reduce waiting times but keeping costs*	To face the challenge through the application of techniques and methods to improve efficiency that have been applied successfully in other industries.
28	Simon and Canacari (2012)	D	*Lean management theory has a long history of success in manufacturing. The same Lean principles and tools that are applied in manufacturing plants are directly applicable to the healthcare setting*	The root cause for failures is often the same for manufacturing and health care breakdowns in communication and misunderstanding the needs of customers. (to give guidelines)
29	Smith et al. (2012)	D	*A regional Public Health Incubator engaged the North Carolina State University Industrial Extension Service to apply Lean approaches to local health agencies in the region*	To improve workflow and help processes become more efficient.
30	Stelson et al. (2017)	E	*In healthcare environments, kaizen projects are successful if achieve changes that permanently maintain and improve the quality of care and patient outcomes*	To study factors affecting the success of continuous improvement projects in healthcare
31	Stonemetz et al. (2011)	D	*Hospitals in the United States are facing increased financial pressures, and many are focused on waste reduction efforts*	efforts to improve patient outcomes or increase patient safety; to make health care more cost-effective, in part from reduction of unnecessary waste
32	Tetteh (2012)	D	*To analyse a Process Improvement Model for Health Care*	To describe the kaizen methodology
33	Waldhausen et al. (2010)	D	*Patients are often required to wait for considerable periods of time after coming to the office to see a physician*	To improve surgical clinic process
34	Wennecke (2008)	D	*Facilitating a Kaizen event in healthcare is a challenge not only because the processes often entail a complicated information flow with many people involved, but also because processes often differ from time to time*	To understand how to implement improvements in healthcare settings within a week
35	Yusof et al. (2012)	E	*Quality management methods were introduced into healthcare organizations during the 1980s.The selection of these techniques depends on multiple factors: organizational requirements, objectives and environment, available resources and knowledge.*	To improve process efficiency by eliminating non-value-added activities. The Lean method is a good option for optimizing clinical workflow, because it focuses on detailed process components.

* D: descriptive; E: empirical

Team and personnel involvement in kaizen initiatives is a clear feature of continuous improvement approach, but the effects of social outcomes on the kaizen initiatives success are not completely faced by literature. In fact, merely some of the reviewed articles (6 papers, 17%) introduce a little attention to social outcomes, even if the declared aim is to describe and measure technical outcomes. Moreover, only 2 recent

papers are explicitly focused on social outcomes with an empirical approach (Bortolotti et al., 2018; Stelson et al., 2017).

Exclusively 2 papers out of 35 focused on different topics of research in healthcare respect to technical or social outcomes:

- Exploring dynamics of network emergence supporting the outcomes of CI initiatives (Papadopoulos et al., 2011). Empirical study;
- The role of dynamic associations in a case of continuous improvement applied in an English hospital (Papadopoulos, 2011). Empirical study;

Summarising, the paper reviewed focus on the following outcomes:

Table 2.2 Technical outcomes vs Social outcomes investigation

PAPER FOCUSING ON:	N° OF PAPERS	PERCENTAGE
Technical outcome	25	71%
Social outcomes	2	6%
Both Technical and Social outcomes	6	17%
Other Issues	2	6%
Total	**35**	**100%**

As confirmed by the existing body of knowledge, the philosophy of continuous improvement is based on the following pillars:

1. Understanding the voice of the customer and creating the value from his/her perspective;
2. Doing more with less waste of resources, time and efforts;
3. Achieving process efficiency thanks to waste reduction;
4. Involving and respecting human resources, in the sense of their intelligence and humanity.

The latter aspect is essential for stimulating the personnel commitment and generating social outcomes, in order to sustain the technical results and the learnt methodology.

In this sense, it is known that organisations applying the kaizen philosophy struggle to guarantee benefits of CI initiatives in the long-term timeframe. This difficulty is common in each sector, healthcare included.

Healthcare recent literature is starting to face the issue concerning the generation of social outcomes necessary to achieve constantly technical outcomes and process performance improvements. The active involvement of professionals and the strong commitment to change are specific topics currently under investigation by managerial and medical science practitioners and researchers.

First, a definition is needed. It is confirmed by the literature (Farris et al., 2009, Stelson et al., 2017, Bortolotti et al., 2018) that social outcomes are necessary for guaranteeing a sustainable continuous improvement and contribute to generate technical outcomes. Social outcomes are considered as two dimensions: the problem-solving capabilities of employees and the attitude (Farris et al., 2009, Bortolotti et al., 2018). The attitude concerns the level of enthusiasm, desire and comfort to team work (Jimmerson et al. 2005, Bortolotti et al., 2018, Graban and Swartz, 2013).

For these reasons, it is relevant to contribute to this actual discussion on social outcomes and kaizen application in hospital in order to enforce the scientific literature that is at an early stage of in-depth studies.

On the other hand, the commitment to change could be defined as a mindset binding and individual to a course of action considered necessary for the success of a change initiative (Herscovitch and Meyer, 2002).

It is relevant to investigate the role of social outcomes for maintaining technical outcomes over time through empirical and qualitative studies, in order to enforce the existing little kaizen literature in healthcare.

Moreover, it could be interesting to investigate if social outcomes and the commitment to organisational change could be enforced by a structured policy deployment (kaizen program) from the first kaizen experiences in hospitals. This gap is not still investigated in managerial literature and no scientific contributions are published.

Filling the gap: relevance of the academic contribute

This thesis contributes to fill the literature gap by providing an empirical study on kaizen initiatives in public hospital. It starts from existing findings on social outcomes to set up a theoretical framework for policy deployment in kaizen environments in healthcare.

In particular, beginning with the determinants examined by Bortolotti et al. (2018), the action research aims at proposing and testing a theoretical framework to trigger a kaizen policy deployment in hospitals, also considering the impact of social outcomes and their determinants to achieve and feed the continuous improvement mindset.

Specifically, this research contributes to overcome the limitations of the existing literature:

- The lack of scientific studies on social outcomes, despite their relevance for feeding continuous improvement mindset;
- the lack of empirical studies on social outcomes by using the action research methodology, facilitating the collection of behaviours and the observation of social outcomes during the concurrent activities
- the focus on dynamics at both organisational and team level, dynamics between directional and operative level and determinants of social outcomes facilitating the continuous improvement implementation in a long-term perspective.;
- a lack of tested strategic tools considering also the social outcomes and the commitment to organisational change to apply the policy deployment in hospital for the kaizen transformation.

Filling the gap: relevance of the managerial contribute

From a managerial point of view, the research aims at providing reliable results from the empirical practice, to give some robust and grounded guidelines to practitioners for approaching the kaizen methodology in healthcare in a prompt and correct way from the first trials, paying the appropriate attention to social outcomes and their determinants in acting kaizen initiatives.

This study:

- provides findings from the field in real time, exploiting the direct experience of the researcher and the direct experience of professionals completely involved in the process;
- facilitates the test of the framework proposed: concurrent actions in the hospital processes permit to face emergent critical issues in a hospital setting and enact a decision-making process in real time for realizing countermeasures that initially were not planned.
- allows to adapt and modify *in itinere* the framework by observing and helping professionals involved through the process consultation model (Coughlan and Coghlan, 2002);
- provides a tool tested directly by healthcare practitioners and managers useful for applying policy deployment in hospitals and maintaining the kaizen mindset. The effect should be to sustain the organisational change over time with the tested framework. Moreover, the framework is not provided by external consultants but experienced by professionals of the sector.

The theoretical framework proposed and tested considers both dynamics at organisational and team level, dynamics between directional and operative level; determinants of social outcomes facilitating the continuous improvement implementation in a long-term perspective in a policy deployment perspective.

Long-term perspective for organizing continuous improvement in healthcare at strategy level is still under investigation (3)

Healthcare studies facing continuous improvement are more focused on specific kaizen initiatives for proving their specific performances (Table 2.3), even if the organizational complexity to maintain this managerial approach over time is a well-known critical issue. For simplifying the comprehension, during the review in healthcare literature:

- the meaning "short-term perspective" (abbreviation: short-term) is associated to the timeframe and to the performances of a specific kaizen initiative. In literature, papers facing specific kaizen initiatives have been classified as *papers focusing on a short-term perspective*;

- the meaning "long-term perspective" (abbreviation: long-term) is associated to at least a 1-year timeframe and performances organised in a kaizen initiative design at organisational level (Hoshin Kanri or policy deployment). In literature, papers introducing or facing this subject, even if in different manners, have been classified as *papers focusing on a long-term perspective.*

Papers focusing on a short-term perspective but introducing a little attention to the long-term have been classified as "*papers focusing on a short-term perspective, with a starting discussion on long-term perspective*".

Table 2.3 Short-term vs Long-term in healthcare literature

PAPER FOCUSING ON:	N° OF PAPERS	PERCENTAGE
Short-term perspective	24	69%
Short-term perspective with a starting discussion on long-term perspective	10	29%
Long-term perspective	1	3%
Total	35	100%

As further found in the wider literature, few publications have given a scientific and managerial contribution on long-term kaizen deployment: Van Aken et al., 2010 provided a Kaizen Event Program Framework (KEPF) as result of a case study in the Belgian Armed Forces. Glover et al. (2013) provide a contribution on KE Program characteristic explicitly useful for the sectors object of their study: manufacturing, finance, information technology, food production and defense. Moreover, findings for future research are based on cases holding a consolidated continuous improvement mindset.

The relevant issue faced by this little literature (Van Aken et al., 2010; Glover et al., 2013) is how to guarantee the incremental improvement in any organization and what managerial tool could be designed and applied as a framework. It seems that there is a lack of systemic and empirical-based guidance on how to address policy deployment for continuous improvement. If this challenge concerning manufacturing and service industry is under the lens of researchers, the gap in healthcare literature need to be investigated.

Filling the gap: relevance of the academic contribute

This thesis contributes to fill the literature gap by presenting findings from an action research aimed at investigating how the continuous improvement approach could be implemented in public hospitals over time through a program for kaizen policy deployment. By focusing on the practical features and the occurred difficulties at both strategical and operational level, and at team and organisation level, this study contributes to overcome the limitations of the existing literature, by providing:

- empirical results from a kaizen experience in healthcare with two combined peculiar features, not existing simultaneously in literature: hospitals facing kaizen for the first time (1) by using a policy deployment framework (2) adaptable during the project, according to the difficulties occurred.
- empirical results from the implementation of a kaizen program framework used by seven hospitals, belonging to the same regional healthcare authority;
- a structured guidance to integrate multiple kaizen project in a long-term perspective and strategy.

Filling the gap: relevance of the managerial contribute

From a managerial point of view, the research aims at providing reliable results from the empirical practice, in order to provide:

- a versatile and solid tool for the healthcare environments aiming at experiencing the kaizen methodology for the first time, avoiding the only use of bottom-up initiatives;
- useful lessons to understand the needs of both managers and operative professionals during the kaizen methodology fulfilment;
- useful practices to combine strategic management and operational management by linking the achievement of top management goals with daily operations thanks to the continuous improvement approach (top down – bottom up approach).

What a CI Program (long-term kaizen) should be is under investigated (4)

What a CI Program should be is not fully faced in healthcare literature (5)

As marked by the literature review, kaizen program in healthcare is quite a new topic discussed among scholars. The long-term perspective is introduced by Dickson et al., (2009), Jacobson et al. (2009); Ng et al. (2010), Waldhausen et al. (2010), Laganga et al. (2011), Leeuwen et al. (2011), Naik et al. (2011), Papadopoulos et al. (2011), Yusof et al. (2012). Their contributions and considerations are listed below in Table 2.4.

Differently from the mentioned authors, Mazzocato et al. (2016) explicitly faced the issue on kaizen programs, discussing how the entire kaizen process relates to the overall organisational goals from the employees' perspective through their improvement suggestions. The empirical contribution, generated by the qualitative analysis of 186 structured kaizen documents, is summarized as follows:

- In healthcare environments, there is a need to spread kaizen practices at management level going beyond the establishment of a correct communication flow;

- It is necessary to generate and maintain coherence among the process improvements of the organization and its social, technical and structural mechanisms during a kaizen transformation.

Table 2.4 Introduction of the relevance concerning long-term perspective in kaizen healthcare literature

	Authors	**Contribution/Considerations provided**	**D/E***	**Social outcome considered Y/N**
	LONG TERM PERSPECTIVE IN HEALTHCARE ENVIRONMENTS			
1	Dickson et al., (2009)	*Lean must be regarded as an <u>educational tool</u> for both frontline workers and leadership because it introduces discipline and accountability when all concerned are motivated by an organizational strategy of better performance. Given a favourable combination of <u>key factors</u>— engaged frontline workers who come to own Lean, <u>long-term</u> leadership commitment, and workforce flexible to change—<u>deployment</u> of Lean could <u>continuously</u> improve patient flow, service, and growth in the ED*	D	Y
2	Jacobson et al. (2009)	*Continuous Quality Improvement (CQI) Program in Emergency Department as a 24 hour-a-day mechanism to promote continual improvement. The Kaizen Program should be studied with a <u>multicenter prospective approach</u>*	D	N

3	Naik et al. (2011)	*alignment between ED improvement initiatives to hospital-wide organizational change.* *Departmental goals were aligned with broader hospital-wide goals in the lean transformation.* *Executive-level planning sessions and the use of multiple tools, flow mapping, and A3 thinking, both within and outside of RIEs, ensured a comprehensive perspective to a wide spectrum of potential processes for improvement. Executive commitment, both on hospital and departmental levels, was critical for successful lean transformation.*	E	N
4	Ng et al. (2010)	*The greatest challenge in implementing the Lean system involves creating and sustaining the ongoing projects, which requires leadership and support from ED and senior hospital management.*	D	N
5	Waldhausen et al. (2010)	*The one-year sustained results indicate that the system can be replicated among different providers and ones newly introduced to the system.*	D	N
6	Laganga et al. (2011)	*For future research, prioritization guidelines could be developed by studying the factors that predict the overall and enduring value of projects.* *Lean approaches are included in the quality improvement recommendations for organization-wide system transformation in public health*	E	N
7	Leeuwen et al. (2011)	*Six Sigma Program* and the *control pyramid of Juran*	D	N
8	Papadopoulos et al. (2011)	*Process improvement programmes aimed at improving the efficiency and effectiveness of the delivery of healthcare.* *Recent literature on the implementation of change programmes in the NHS highlights the importance of networks in effecting and affecting the outcomes of these Programmes. The paper highlights the role of orchestrating the views and agendas of the various actors in a network (actor-network) to create spaces and choice points that facilitate a shift from entrenched routines to new process organisation.*	E	N
9	Yusof et al. (2012)	The Lean method *needs to be implemented enterprise-wide and with extensive training and knowledge acquisition*	E	N

* D: descriptive; E: empirical

These papers introduced the need of an alignment between improvement projects' goals and broader hospital-wide objectives (long-term perspective) and the relevance of a structured hospital-wide organizational change by linking strategy and operative levels (policy deployment) in a coherent way.

By enlarging the literature research beyond the healthcare boundaries, specific contributions on kaizen program in manufacturing and service industry were identified, as listed in Table 2.5.

Table 2.5 Long-term perspective in environments different from healthcare

		LONG-TERM PERSPECTIVE IN ENVIRONMENTS DIFFERENT FROM HEALTHCARE		
	Authors	**Contribution provided**	**D/E***	**Social outcome considered Y/N**
1	Van Aken et al. (2010)	Provides a framework for the design and management of a Kaizen Event Program for systematically using kaizen events as short-term improvement projects. <u>Limitation</u>: it presents findings from only one sector: defence.	E	Y
	Glover et al. (2013)	Provides a better awareness about the characteristics of established Kaizen Event Programs <u>Limitation</u>: findings could be used in the same sectors investigated during the study, as declared by authors: manufacturing, finance, IT, food production and defence.	E	Y
	Bessant and Francis (1999)	Continuous Improvement is considered as a dynamic capability. Authors provide a sequential scale of evolution of CI performances and practices across an organization from level 0 (no CI activity) to level 5 (learning organization). The study focuses the attention to the level 3 related to the policy deployment. <u>Limitation</u>: the study considers only the opportunity to follow the sequential scale, but not to skip the first two levels for starting immediately with level 3.	E	Y

* D: descriptive; E: empirical

These studies provide some insights on how to design a Kaizen Program (Van Aken et al., 2010) and on the characteristics it should display (Glover et al., 2013). Moreover, Bessant and Francis (1999) present a scale of evolution for continuous improvement, by concentrating the study on the policy deployment and its key enablers. All these authors face the issue of a long-term perspective in practicing continuous improvement in manufacturing or service industries. In healthcare literature, this issue has not been fully faced by scholars until now. There is only a discussion on it, expressing requirements to overcome the issue on sustaining the CI approach.

Filling the gap: relevance of the academic contribute

Starting from the literature insights, this research project contributes to fulfil the existing lack of empirical studies about the features of a kaizen program in healthcare. In particular, it presents the features and practices of a Kaizen Program (what) and their

sequence for a successful implementation in a healthcare system. Moreover, the study illustrates the practices of an integrated kaizen program, applied by seven different public hospitals. It also compares kaizen program deployment in a manufacturing context with the ones applied in healthcare to find similarities or differences.

Filling the gap: relevance of the managerial contribute

From a managerial point of view, the research aims at providing reliable guidelines and recommendations as result of the tested framework applied in the action research
These results will support healthcare practitioners and managers interested in launching a continuous improvement development offering a robust tool for kaizen design and implementation.
The key strength of these guidelines and recommendation is that they are the result of seven different hospital experiences sharing the same modus operandi.

How the long-term kaizen should be deployed in healthcare is uncleared in literature (6)

Besides the gaps specified in the previous paragraphs, in healthcare literature there are no exhaustive contributions about the modalities to design and activate a policy deployment mechanism and proceed with a kaizen program practice.

Filling the gap: relevance of the academic contribute

From an academic point of view, the research aims at providing standard tested modalities for deploying a kaizen program successfully. Specific modalities per each phase of the kaizen program will be detailed, from planning to practice across the training.

Filling the gap: relevance of the managerial contribute

From a managerial point of view, practical suggestions are proposed to managers and professionals for correct procedures in kaizen initiatives, stressing the linkage between

operative kaizen and strategic kaizen actions. This study also suggests modalities to practitioners to prevent operative barriers.

RESEARCH QUESTIONS

As previously mentioned, the literature gaps to be filled through this research project are as follows:

- Lack of empirical studies investigating kaizen initiatives in healthcare (1).
- Little investigation on social outcomes as outputs of kaizen initiatives (2) .
- Little focus on long-term perspective for organizing continuous improvement in healthcare at strategy level (3).
- No scientific clarity (4) and fully comprehension in practice (5) on what a Kaizen Program should be in a healthcare context.
- Lack of knowledge on how a Kaizen Program should be deployed in healthcare (6).

The research questions are formulated to respond to the gaps n.4, n. 5 and n. 6, related to policy deployment in healthcare organisations (what and how). Moreover, they offer a scientific contribution to all the other gaps found in the literature review, as illustrated in Figure 3.1

Figure 3.1 Conformity between Research Questions and Gaps
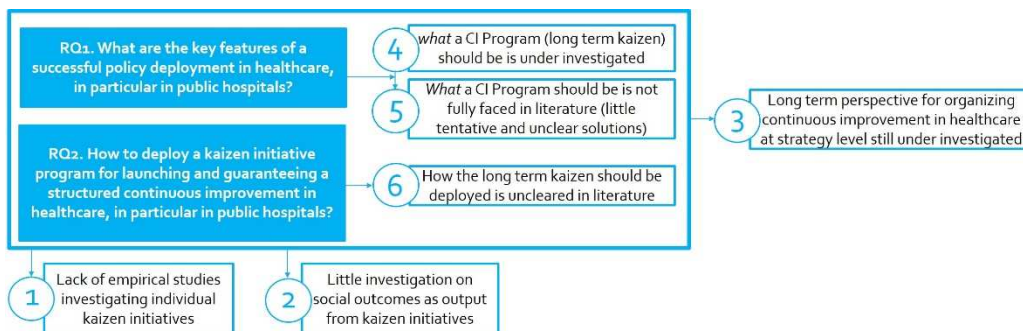
The first research question is meant to fill the gaps n. 4 and n. 5:

RQ1. What are the key features of a successful policy deployment in its initial implementation phase in healthcare, in particular in public hospitals?

Success is meant:
- firstly, to face the launching of a long-term kaizen perspective and overcome cultural barriers at the first beginning of the implementation;
- secondly to sustain policy deployment of continuous improvement over time, starting from the first deployed initiatives, linked to the hospital governance.

The second research question aims at giving a response to the gap n. 6:

RQ2. How to deploy a kaizen initiative program for launching and guaranteeing a structured continuous improvement in healthcare, in particular in public hospitals?

Moreover, these two research questions are meant to fill the gap n. 3. The long-term perspective is to be explained through a policy deployment implementation, highlighting characteristics (what), sequence (when) and modalities (how).

These two research questions indirectly contribute to fill the gap n. 1 and the gap n. 2 respectively. In fact, this study:

- is **empirical** (action research);
- provides an first **investigation on social outcomes**, in addition to the technical outcomes reached.

The project object of the study and the methodology chosen

To target the research questions, a group of seven public hospitals, belonging to a regional healthcare system in Italy was investigated during the first structured design and introduction of the managerial continuous improvement approach. The implementation of the kaizen methodology was led by a Regional Authority with a strong attention to the alignment between top management goals and daily operation targets.

The focus is to test the theoretical framework for policy deployment proposed. The scientific chosen methodology is the *action research*. The researcher investigated the organisational change and was actively involved in each phase of the project.

Originality of the study

The study proposed is significant to augment the existing knowledge on continuous improvement in healthcare. More specifically,

1. *The study is focused on a kaizen initiative program instead on a specific kaizen initiative.*

   This study intends to extend previous findings regarding the design and the deployment of a Kaizen Initiative Program in an overlooked context, such as the public healthcare. The poor literature available is mainly addressed to manufacturing and tertiary industry (Glover et al., 2013; Van Aken et al., 2010). Moreover, in lean healthcare literature scholars are still focused on single kaizen initiatives (short-term) instead of looking at a strategic kaizen deployment (Kaizen Initiative Program, long-term).

2. *The investigation of kaizen policy deployment is conducted in public hospitals.*

   Emerging from the literature review, current scientific studies in healthcare mainly focus on: 1) specific kaizen initiatives, analysing their technical results; 2) comparing technical results among different kaizen experiences, belonging to the same hospital, to different hospitals or to different healthcare systems. Among them, only 29% face these topics empirically (case studies, qualitative analysis and action research). Thus, the current literature is addressing to specific kaizen initiatives in healthcare as units for analysing the technical outcomes. Cases focus on both first and consolidated kaizen experiences, but singularly. Moreover, the long-term perspective for organizing continuous improvement in healthcare at strategy level is actually at an early stage of investigation.

3. *The peculiarity of the context investigated.*

Unlike the existing kaizen healthcare literature, this research involved seven different and independent hospitals, carrying out the same first kaizen experience simultaneously. The hospitals belong to the same regional healthcare system and are led by their regional administration authority. This authority strategically coordinated the whole project. The hospitals followed a unique modality of implementation (A3-Report) and engaged their own human resources. Summarizing, the peculiarity consists in a centralized coordination of the kaizen project.

4. *The study investigates the application of a Kaizen Program as the first kaizen initiative experienced, linked to the organisation governance.*

   In the little literature concerning the kaizen initiative program, scholars pay attention to contexts which have been using a systematic approach for years (Van Aken et al, 2010; Glover et al, 2013).

5. *The investigation of kaizen policy deployment in public hospitals through an action research.*

   There are no studies adopting *research in action* for investigating kaizen program implementation in healthcare.

   Thus, this research aims at investigating the policy deployment of the continuous improvement approach in healthcare. The units of analysis are all the seven public hospitals belonging to the regional healthcare system and the system as a whole. Practical issues were faced and solved following a theoretical framework for guaranteeing the policy deployment in a timeframe of minimum 12 months. *Moreover,* as emerged from the literature, the action research is not a common methodology for investigating kaizen initiatives in public hospitals as empirical methodology. There are no studies adopting *research in action* for investigating kaizen program implementation in healthcare. This methodology enriched the previous findings, which were focused on policy deployment through kaizen initiative programs in manufacturing (Bessant & Francis, 1999; Glover et al., 2013; Van Aken et al., 2010), by adding healthcare as new field of study. Moreover, the study investigates a first experience of kaizen program.

Researchers intend to introduce a tested and versatile framework emerged from the action research for successfully selecting kaizen initiatives linked to strategical objectives in healthcare, involving professionals and guaranteeing the implementation of kaizen initiatives.

Synthesis

The originality of this research lies in the setting explored: a regional healthcare service, composed by seven public hospitals, experiencing the kaizen approach for the first time. Moreover, the kaizen experience is based on a theoretical framework of implementation, that could be used from the beginning.

The framework could represent the version of Hoshin Kanri for healthcare, whereby policy deployment could be enhanced starting from first kaizen experiences in healthcare.

As Witcher and Butterworth (2001) assume, Hoshin Kanri is a form of corporate-wide management that combines strategic management and operational management by linking the achievement of top management goals with daily operations. The authors affirmed that this kind of management provides focus, alignment, and integration of policy into operations. Furthermore, it needs to be considered as a full-fledged process. This organizing framework is designed to cover at least an annual timeframe and follows the PDCA methodology.

The project aims at introducing the concept of Hoshin Kanri, (correspondent to policy deployment in the occidental language) in the healthcare field, considering public hospitals, as illustrated in the Figure 1.2 below.

Figure 3.2 Policy deployment of kaizen methodology in public hospitals

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CHAPTER 4
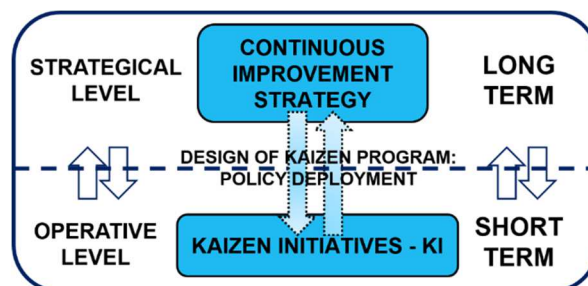
RESEARCH METHODOLOGY

To target the research questions, a *research in action* was conducted by following the methodology of Coughlan and Coghlan (2002) to observe the dynamics of the organisational change happened in the seven hospitals involved.

According to these authors, the *Action Research* (hereinafter *AR*) is suitable for addressing the scientific questions when:

1) **An unfolding sequence of actions in a certain group, community or organisation is described step-by-step.**

   The community investigated is part of a regional healthcare system composed by seven public hospitals. Almost 400 professionals working at the seven public organisations and belonging to different teams participated actively to the whole project. The researcher accurately analysed the organisational change under the lens at different levels:

   a) Individual level

   b) Team level

   c) Hospital level (strategic);

   d) System level, considering together the hospitals belonging to the regional healthcare service.

   The organizational change consisted in introducing and applying a managerial approach different from the traditional applied, focusing on increasing the efficiency and the efficacy of the healthcare public services and processes by involving actively the operative professionals: the lean healthcare management. Kaizen was the chosen lean methodology chosen. The principal tool used for implementing this methodology is the A3 tool. The original feature of the research is that hospitals experienced their first kaizen initiatives aligned to the organisational strategy, by deploying a structured logical framework (Kaizen Program).

2) The researcher, as a member of the team, understands how and why the action could change or improve the working of some features of the investigated system.

During the project, the researcher worked actively in close contact with healthcare professionals at any level. She played different roles:

   a) Trainer (operative level);;

   b) Advisor and supporter of the Board of Directors (strategy level);

   c) Spokesperson of tutors' and members of the different kaizen teams to communicate needs and uncertainty to the Board of Directors (linkage between strategy and operations);

   d) Advisor and supporter to kaizen teams (operative level);

   e) Mentor of kaizen teams (operative level);

   f) Facilitator (strategy and operative level).

As completed involved in each phase of the project, the researcher could understand how and why the actions implemented could change or improve the analysed needs and problems by kaizen teams and some of the organisational features.

To guarantee a rationale and impartial analysis and responses, the researcher was helped by a colleague during the whole project. This situation allowed to produce a balanced debate and to reach a logical discussion of the events, avoiding misrepresentations.

3) The process of change or improvement is understood to catch practical and scientific lessons.

During the project, all the dynamics occurred addressing changes or improvement at individual, team and organisational level were observed, analysed and processed in order to provide significative responses and lessons for both practitioners' and academics' issues.

Practitioners' issue (key stakeholders). Undertaking a project for implementing the same management approach at systemic level (across the seven public

hospitals): the lean management and specifically the continuous improvement methodology (*Kaizen*). The challenge is to introduce and stabilize a common long-term logical framework leading the kaizen practice (*Kaizen Event Program)* in each organization as a parallel system to ordinary operations. According to Van Aken et al. (2010) a *Kaizen Event Program* is a structured framework undertaken to systematically use short-term improvement projects (*kaizen events*) when rapid change in specific areas is needed, following the lean management principles. The aim is to create from the first application a strong linkage between strategy and operations (policy deployment): kaizen initiatives have to be selected at strategy level, avoiding pop-corn or bottom-up decisions that could be unsupervised.

The challenges (with uncertainty) to be faced in the medium term are:

a) to use the same methodology of continuous improvement by the whole system involved;

b) to acquire a fluent practical competence for successful kaizen initiatives at regional healthcare system;

c) to generate commitment to organisational change and social outcomes;

d) to select kaizen initiatives linked to strategy (as *modus operandi*), through a shared decision-making process based on a structured mechanism.

The challenge (with uncertainty) to be faced in the long term is dual:

a) to systematically use the tested continuous improvement mechanism (Kaizen Program) in each hospital involved and generate a common management culture at system level;

b) to generate technical outcomes at hospital and system level: increase of efficiency (time and waste reduction compared to limited resources) and increase of the service quality.

Academics' issue:

a) to provide an example on *what* a continuous improvement program in public hospitals could be since the first kaizen experience (scientific perspective);

b) to offer a clear contribution on *how* to deploy a Kaizen Program so as to guarantee a structured continuous improvement practice in public hospitals since the beginning (scientific perspective) linking together strategy and single improvements;

c) to rationalise the lessons learned from the action (scientific perspective);

d) to supply a functional framework from the field for designing continuous improvement at strategy level, guaranteeing a linkage with kaizen initiatives (operative level) through a policy deployment (managerial perspective);

e) to prepare guidelines to hospitals managers for deploying a *Kaizen Program* and guaranteeing a link with kaizen initiatives (managerial perspective).

Furthermore, this research project is consistent with the features highlighted by Coughlan and Coghlan (2002): 1) research in action, rather than research about action; 2) participative, 3) concurrent with action; 4) a sequence of events and a problem-solving approach.

1) Research in action, rather than research about action

A scientific approach was applied to investigate the organisational change in a Regional Healthcare System (composed by n. 7 public hospitals). It consisted in introducing the continuous improvement culture through a structured logical framework in each hospital involved starting from a first focused kaizen initiative. The logical framework of the Continuous Improvement Project (CIP) was performed in 4 main steps (cyclical process): Design; Training; Kaizen; Evaluation. Finally, the overall evaluation was conducted and provided. As described in Figure 4.1, each main phase was conducted as a *six main steps* phase of the *action research* (to gather data; to feedback, to analyse data; to plan; to implement; to evaluate actions).

The cyclical process was:

a) preceded by a pre-main step addressed to understand the healthcare context and the purpose of the project at the practitioners' perspective;

b) constantly monitored, addressing the academic dissertation aim (meta-step);

c) evaluated by the researcher as final.

The project lasted 15 months: from July 2017 to September 2018 included. It consisted into two main phases:

-   The Kaizen Initiative Program implementation, that lasted 12months from July 2017 to June 2018 included;

-   The overall evaluation phase, lasting three months from July 2018 to September 2018 included.

The project developed both strategic and operational level in all hospitals involved.

Figure 4.1 The Action Research Design
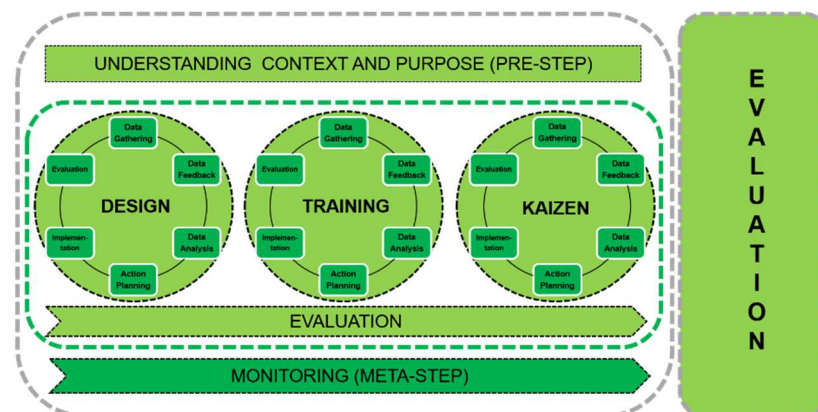
2) Participative

All the professionals participated actively in each step of the cyclical process to go further with the activities. Different types of figures were involved, depending on the decision-making level: top management, middle management,

tutors, operative professionals (physicians, nurses, human resources officers, clerks, technicians, computer engineers).

3) Concurrent with action

The aim of the research is dual:

4) to guarantee the efficacy of the action at strategic and operative level by adopting a scientific method (managerial contribute);

5) to build knowledge at scientific level at the same time (scientific contribute).

4) A sequence of events and a problem-solving approach

The research project is a sequence of unfolding events or actions aiming to solve an organizational problem identified at process level through a scientific methodology shared by the professionals. After a training course in "the kaizen methodology", all professionals were engaged in practicing the continuous improvement (CI) approach and the basic CI tools.

The macro phases of the project consisted in: Design, Training, Kaizen (Implementation and Monitoring) and final Evaluation. Each hospital involved had to establish a team to implement at least a kaizen initiative. Within the kaizen initiatives, all teams had to:

a) follow systematically the same standardized iterative cycle of practice for solving the selected problem, the Deming Cycle (Plan, Do, Check, Act);

b) use the same tool (A3) to respect the learned cycle of practice.

At project level, all the phases were conducted step by step in a consequential way. Teams and professionals could not decide prior how to proceed with the further activities without finishing the previous ones. As well as at kaizen initiative level, each team had to rigorously respect the Deming Cycle phases in order to proceed and solve the problem of the process chosen:

a) observe and define the problem;

b) draw the current process;

c) analyse root causes;

d) define the objective;

e) Identify the countermeasures;

f) define a plan;

g) implement the plan;

h) monitoring follow up and evaluation.

The role of the action researcher and the emergent process

The action researcher was formally recognized by the key actors of the project and the professionals involved. Her role as facilitator was conducted by using the *process consultation model* (Coughlan and Coghlan, 2002). Practically, the researcher:

- was directly and actively involved in the action;
- provided her contribute to the work of healthcare professionals in inquiring in their issues, creating and implementing suitable solutions;
- analysed the realization and conduction of the *Continuous Improvement Project* (CIP).

She was supported by a colleague during the whole project for avoiding misrepresentations.

Furthermore, the project was an emergent process, as defined by Coghlan and Coghlan (2002). It was characterized by a general plan of actions that could not be estimated in detail beforehand. Actions could be rearranged several times by following the intermediate results from practice and the research was concurrent with action (simultaneously feature).

Research setting and its features

The reliability of this study was ensured at considering the selection criteria used by Farris et al. (2009) and Bortolotti et al. (2018) for classifying the hospitals involved. As listed in Table 4.1, the seven hospitals involved in the project:

6) share the same organisation characteristics: they are Italian public hospitals and belong to the same Regional Healthcare Service;

7) they are coordinated by the same Regional Authority, Responsible for the Kaizen Program implementation;

8) they are experiencing the implementation of kaizen initiatives for the first time;

9) they are experiencing the implementation of a Kaizen Initiative Program for the first time and by following the same framework;

10) they are using the same kaizen method for acting the improvement: the A3-tool.

Table 4.1 Characteristics of the hospitals involved in the project

	Description	H1	H2	H3	H4	H5	H6	H7
Organisation Characteristics	Private/public	Public	Public	Public	Public	Public	Public	Public
	No employees	**4.300**	**3.252**	**2.214**	**5.205**	**3.796**	**700**	**628**
	No. beds*:	**755**	**703**	**341**	**1185**	**657**	**161**	**130**
	Ordinary	*676*	*646*	*311*	*1066*	*602*	*136*	*98*
	Day Hospital	*79*	*57*	*30*	*119*	*55*	*25*	*32*
	Users served	**122.671**	**128.058**	**86.134**	**131.812**	**159.500**	**-**	**-**
Kaizen experience	First kaizen experience: Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	First Kaizen Program Experience: Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Regional Authority – Normative no. 2673 – 30.12.2014 /*year 2018

Research cycles details

The logical framework of the action research was performed in 3 main implementation phases (Design; Training; Kaizen) plus an additional one (Evaluation): Design; Training; Kaizen; Evaluation. Finally, the overall evaluation was conducted and provided.

Each main phase was conducted as a *six main steps* phase of the *action research* (to gather data; to feedback, to analyse data; to plan; to implement; to evaluate actions).

First phase: Design

After a preliminary study to gather and grab data regarding the whole regional healthcare system (pre-step), the researcher designed a general plan according to the practitioners' expectations: introducing a new organisational model linked to the governance, characterized by a problem-solving approach for improving day-by-day operations. For facilitating the setting and the conduction of the research project and a flowing communication between the researcher and the practitioners' team, a governance board was established. The membership was firstly composed by the hospitals' general directors, two representatives of the healthcare regional agency and a scientific director. The researcher was officially part of the governance team.

Design phase was conducted by observing the theoretical six main steps suggested by Coughlan and Coghlan (2002). These are described below:

Data gathering

The researcher collected the information necessary to understand the organisation and characteristics of each hospital involved in the research in terms of: size and number of departments, hub or spoke hospital, urban or sub-urban organisation, areas of specialisation; headquarters and peripheral offices.

Moreover, the researcher acquired information about organisational problems.

This activity was made together with the governance board.

Data feedback

This step was concurrent with the data gathering. Data gathering and feedback were conducted at the same time with the governance board. Thanks to this formula, the

researcher could observe the attitude and the behaviours of each general director during the information exchange and discussions, useful for approaching with the next steps and research cycles.

Data analysis

Data analysis aimed at finding together the better way to design and start the improvement proposal through kaizen initiatives in each hospital. Different options were proposed by the governance board:

- to define a specific programme per each hospital;
- to design a common programme with the same thematic kaizen initiatives in order to facilitate the final comparison among interventions;
- to plan a common programme, keeping hospitals decision-making to choose the issue to be faced by the kaizen initiative.

After a comparison among proposals, it was decided to choose the third option.

Action planning

As the previous steps, action planning was a joint activity. The researcher proposed a theoretical framework to the governance board as a tentative implementation plan. This framework considered four main sequential phases: design and support; education, training, kaizen implementation. It is explained in detail in the next chapter (chapter 6). To be coherent with the stakeholders' overall objective (to introduce a new organisational model for improvement) the team tried to answer to the following questions, facilitated by the researcher:

- what needs to change?
- In which part of the organisations?
- What type of changes do you expect during this experience?
- Which kind of support is needed?
- How do we enhance the commitment to this change?
- What kind of resistance should we face?

Then, the plan was confirmed in its main components and primary details.

A time schedule was designed and shared, to guarantee an appropriate range of time per each phase.

It was also planned to convene periodically the governance board, especially before the transferring from a phase to the following one.

Implementation

The joint plan was implemented. It started on the 1st July 2017 and ended on the 30th September 2018. Concretely, the design phase was the longer one, because included all the other phase as a planning: training, kaizen and evaluation.

This phase was committed to manage, coordinate and find out eventual difficulties and issues at organisational level.

Evaluation

As this cycle phase lasted the whole research period, the evaluation corresponded to the final evaluation of the action.

Intermediate evaluations consisted in the evaluation of the training and kaizen phases at managerial level. Intermediate evaluations were conducted jointly with the governance board in order to face immediately issues and participants' difficulties.

Second phase: Training

Training phase consisted in two main sequential sub-actions: education and training.

It was firstly scheduled during the design phase, but specific details were defined in this particular step. It was decided to address:

- a training programme (education) to the top and middle management for firstly enhancing the commitment from the strategic lines;

- a training programme to the operative professionals as potential facilitators and kaizen initiative mebers.

This phase started on the 1st August 2017 and was expected to end on the 28th February 2018.

It was conducted by observing the theoretical six main steps suggested by Coughlan and Coghlan (2002). These are described below. Some of them were developed simultaneously.

Data gathering

Data gathering consisted in collecting all the top and middle management contacts from all the hospitals involved in the project. Moreover, previous training experiences for kaizen initiatives were collected and analysed by the researcher to present different teaching methodologies to be compared before designing the most appropriate education and training programme.

Data feedback and analysis

Different teaching methods and training programmes were jointly shared and analysed among the governance board members. Content, materials and methods were jointly defined.

Action planning

The training phase with its sub-actions was schedule and planned.

To be coherent with the training aim (transferring practical knowledge on kaizen methodology and approach) the governance team tried to answer to the following questions, facilitated by the researcher:

- Who are the beneficiaries?
- Which kind of training methodology is better to top and middle management?
- Which kind of training methodology is better to operative professionals?
- What is their background?
- What type of knowledge and competencies do you expect to transfer?
- Which kind of training support is needed?
- How do we enhance the commitment through the training activities?

All the following points were specified by answering to the previous questions:

Training programme and main beneficiaries per each sub-action (Education and Training)

Time schedule and duration of each training programme (Education and Training)

Contents and knowledge to be transferred, related to the specific audience

Methods and Material per each training programme

Implementation and concurrent evaluation

Training phase was implemented.

Education sub-action was conducted as planned, without any accident.

Training sub-action was modified in itinere, to face participants difficulties and doubts occurred and to implement the most appropriate actions for transferring knowledge and succeeding.

The evaluation consisted in reflecting on the intermediate outcomes of the education and training activities, analysing feedbacks from participants, especially regarding doubts, incompetence feelings and fear of potential resistance to change in the work environment.

Thanks to this evaluation and to the attention to detail, the expected training phase was changed to respond to the needs of participants, committed to proceed with the project activities.

Finally, this phase started on the 1st August 2017 and ended on the 20th December 2018. Changes occurred during this phase influenced also the next cycle: Kaizen implementation, that was changed respect to the expected plan.

Third phase: Kaizen

Kaizen phase consisted in planning and implementing a kaizen initiative per each hospital, linked to its governance and strategic objectives.

This phase was expected to start in February 2018 and to end in July 2018.

Practically, Kaizen phase was launched in January 2018 and ended on the 30th July 2018, due to the changes occurred in the previous action cycle (Training phase)

It was conducted by observing the theoretical six main steps suggested by Coughlan and Coghlan (2002). These are described below. Some of them were developed simultaneously.

Data gathering, feedback and analysis

Data gathering, feedback and analysis were conducted simultaneously and jointly with all the governance board members. These steps consisted in:

- discussing and definition of the characteristics of the kaizen events in terms of duration, complexity of the issue, departments and professionals involved;
- collecting all kaizen proposals at each hospital level, proposed by the trained professionals as facilitators;
- selecting one kaizen proposal per hospital, in accordance with its top management;

Action planning

Kaizen phase with its sub-actions was schedule and planned.

To be coherent with the project aim (successfully introducing the continuous improvement as an organisational approach toproblem-solving) the governance team tried to answer to the following questions, facilitated by the researcher:

- How do we manage kaizen initiatives?
- Which kind of support is needed?
- Do we need to foresee other little training sessions to refresh about kaizen tools and instruments?
- How do we enhance the commitment through the kaizen activities?
- How can we face concurrent problems or difficulties?

All the previous points were faced by providing rules, guidelines, recommendation and suggestions to the kaizen leaders and their team members:

Moreover, kaizen implementation was scheduled with intermediate deadlines in order to give a specific timing per each phase of the PDCA cycle during the interventions.

Implementation and concurrent evaluation

Kaizen phase was implemented.

During each kaizen initiative (n. 8 initiative in total), researchers used different methods of inquiry to support and facilitate teams. Each kaizen team was individually supported by the researcher. Specifically, the researcher helped leaders to: elaborate data in a logical and constructive manner; to observe dynamics in the processes, helpful to better understand data; to reflect about the events occurred through the main step of the PDCA Cycle; to consider parallel solutions to the problems/difficulties occurred.

During the implementation teams requested to have the opportunity to compare their initiatives each other, before the ending.

This was the most important change during this phase: a meeting was organised in order to present each initiative and to receive feedbacks from all the participants of the project. The evaluation was concurrent and unfolding respect to the implementation. Teams and the researcher evaluated the kaizen initiatives step by step in order to proceed in an appropriate way.

CHAPTER 5

THEORETICAL FRAMEWORK

Starting from the literature review, the researcher considered the key words *Kaizen Initiative* and *Kaizen Initiative Program* as guidance for proposing the theoretical framework to be tested in the action research.

Kaizen Initiative instead of *Kaizen event*, because the improvement project with a dedicated team in healthcare could last from few weeks to few or several months. This is a peculiarity of the kaizen implementation in a healthcare context, especially in hospitals, because professionals are in continuous and direct contact with their clients who is the patient or citizen asking for any healthcare service. As a service, the care or therapy provided includes the user's participation during its delivery. Moreover, this service refers to the human health. For this motivation, the researcher used the term *Kaizen Initiative* (hereinafter KI) from Bortolotti et al. (2018): a structured project performed by a heterogeneous team for improving a specific process in a defined time schedule.

With reference to the context of the study and the terminology chosen, the researcher adapted the key word Kaizen Event Program from Van Aken et al. (2010) and provided the definition of a *Kaizen Initiative Program.*

In fact, according to Van Aken et al. (2010), a Kaizen Event Program is represented by a systematically use of kaizen to introduce rapid change in targeted working areas, based on lean principles.

For this study, a *Kaizen Initiative Program* (hereinafter KIP) is defined as a structured policy framework applied for systematically implement kaizen initiatives and thus to introduce a permanent change in selected processes, complying with lean principles and aligning operation goals with the organisational policy.

In detail, the characteristics of this KIP are:

a) a strict adherence to lean principles;

b) a structured mechanism for continuous improvement to be activated and maintained;

c) strategic management with a clear focus on continuous improvement mechanisms;

d) a precise alignment of kaizen initiatives with the organisational strategy (policy deployment);

e) targets to be identified and clearly communicated;

f) a reliable monitoring system to be performed;

g) a participative approach to be spread.

Differently from the Continuous Improvement (CI) Evolution proposed by Bessant and Francis (1999) as a maturity process of moving towards the CI capabilities including six consequent steps of evolution from *Level 0 - no CI activities* to *Level 5 - the learning organisation* (Figure 5.1), the theoretical framework provides a solution to imprint a structured kaizen mechanism from the preliminary endeavours by:

1) giving a particular attention to the mindset for problem solving

and

2) establishing a linkage between strategic and operational management.

Figure 5.1 Learning Process from literature

Source: Bessant and Francis (1999)

Therefore, this study aims at confirming that the learning process could start by skipping from level 0 to level 2 (structured and systematic CI) of Bessant and Francis's scale (1999) due to the fulfilment of the theoretical framework applied in the action research. Moreover, this framework is introduced in a healthcare service system, including seven Italian public hospitals.

The framework respects all the characteristics of performance and practice for a structured and systemic CI defined by Bessant and Francis (1999), as illustrated in Table 3.2.

Table 5.1 Theoretical Framework: performance and practice

Theoretical Framework	
Performance	**Practice**
Local level effects due to the kaizen initiatives realized (social outcomes) Measurable CI actions: - *No. participants* *No processes selected for improvement* Measurable performance effects limited to the KIs boundaries: *technical outcomes and social outcomes* Little or no bottom line impacts, *as profit, social and environmental objectives (Osland and Zhou, 2013)* Inception of policy deployment	Formal endeavour to incept and maintain CI Use of a declared and official problem-solving process Participative approach Participation enhancement Structured training in basic CI tools: Structured management system Recognition system Parallel system to processes Cross-functional work for ad hoc kaizen action

Source: Adapted from Bessant and Francis (1999)

The empirical test of the framework through the action research allows the researcher to investigate the organisational change due to the kaizen approach spread in a system of seven public hospitals through a policy deployment process. Moreover, the success of the Kaizen Program could be tested.

It is necessary to emphasize that the Kaizen Program was managed and coordinated by the Regional Authority to which the hospitals belong.

According to Witcher and Butterworth (2001) policy deployment (as Occidental version of the Japanese concept of *Hoshin Kanri*) could be defined as an organizing framework for achieving policy-based purposes. The authors describe these purposes as concrete targets to achieve in daily actions: Quality, Cost, Delivery, Education.

The researcher adapted these defined targets for the context investigated: the hospital environment and its healthcare system.

Table 5.2 Policy-based targets in healthcare

Policy-based targets		
Witcher and Butterworth (2001)	**Adapted for Healthcare (environment to be investigated)**	
Quality, as customer's issues	Quality, as patient's or user's issues	**TECHNICAL OUTCOMES** to be achieved step-by-step due to Kaizen Initiatives, aligned to policy-based targets
Delivery as innovation and logistics	Delivery as readiness and appropriateness of the care service provided	
Cost as a financial item	Cost as financial item	
Education as employee issues	Education as inception of problem solving capabilities and team work attitude	**SOCIAL OUTCOMES** to be enhanced step-by-step due to the policy deployment process and to the activated Kaizen Initiatives

Source: Adapted from Witcher and Butterworth (2001)

According to Witcher and Butterworth (2001), it is relevant to stress that the policy deployment mechanism should be designed and managed as a process and it is needed to activate a monitoring system to make it reliable, as marked by Naik et al. (2011) and Ng et al., (2010).

Following all these premises, the architecture of the Kaizen Initiative Program proposed is represented in Figure 3.1.

Table 5.3 Architecture of the Kaizen Initiative Program

Process	Sub-processes and Activities

1 – Design and Support	*Planning*
	    Establishment of the Umbrella Steering Committee (USC)
	    Overall objective identification
	    Strategic definition of the main features of the Kaizen Initiatives
	    Identification of the method to be used.
	    Scheduling

	Coordination
	  Project and objectives dissemination
	  Recognition of the established kaizen teams
	  Kaizen Initiatives Selection and Coordination
	  Monitoring and Evaluation
	  Exchange of experience among teams

	Dissemination of results Sharing of results and lessons learnt
2 - Education	*Communication of the long-term strategy* (one-year kaizen)
	Orienting to kaizen methodology
	Selection of potential team leaders
3.- Training	*Methodology and Tools Training* Focusing on transferring basic lean tools
	Transferring Knowledge Training Focused on transferring knowledge to tutors for training their collaborators

4 – Kaizen Implementation	*Preparation*
	    Identification of the specific work team
	    Identification of the initiative boundaries
	    Communication of implementation rules

	Execution
	    Kick off Meeting
	    Training Team
	    A3 tool methodology Application
	    Check of improvements
	    Measuring and adjusting
	    Standardizing new working behaviours

The theoretical framework was proposed to the Regional Healthcare Authority interested in introducing the continuous improvement mindset in the seven hospitals of the regional system. Two researchers helped professionals in the different phases of the action research.

The main scope for the Regional Authority was to successfully share a common mechanism for improving processes and performances within the hospitals, coordinated at directional level and activated at operative level due to an alignment between strategy and daily routine. Different roles and positions across the hospitals were involved:

-   Top Management: General Director, Medical Director; Medical Directorate and Health Professions Office; Financial Office.

- Middle Management: Department Head Offices; Human Resources Office; Administrative Office.
- Operative Level: Physicians, Nurses, Clinical Engineers, IT Engineers, Healthcare Assistants.

The conceptualisation of the policy deployment to put into practice at systemic level is represented in Figure 5.1.

Figure 5.2 Policy deployment concept at systemic level

CHAPTER 6
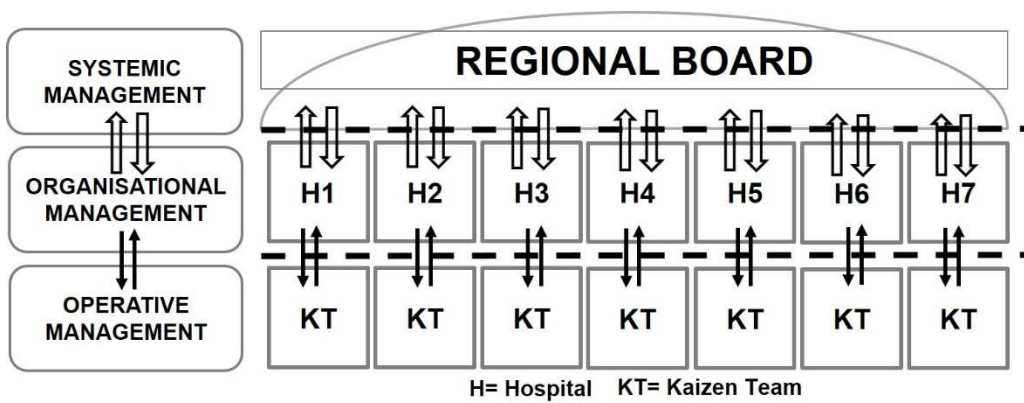
PROJECT DESCRIPTION

The action project started in July 2017 (15th) and finished in September 2018 (30th). It included two main research phases:

- The Kaizen Initiative Program implementation, that lasted 12months from July 2017 to June 2018 included;
- The overall evaluation phase, lasting three months from July 2018 to September 2018 included.

The project was officially named "Moving towards Lean Management in Healthcare" (hereinafter: MtLMH) for facilitating the comprehension of its topic by healthcare professionals to be involved.

The project respected practically the architecture of the theoretical framework proposed. The plan consisted in 1) testing in practice the Kaizen Initiative Program and 2) gathering information on the concurrent organisational change to provide reliable responses to the research questions. Thanks to the action research method, phases were observed, analysed and changed (if relevant) using the six-step circle: gathering, feedbacks and analysing data; planning, implementing and evaluating.

The project is described in Figure 6.1

Figure 6.1 The Project
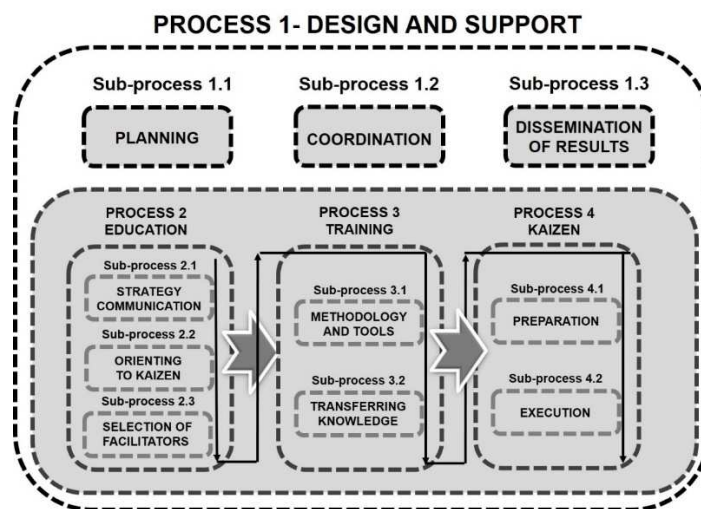
Rationale for action. At the beginning, the key actors of the healthcare system wishing to trigger an organisational change were represented by the members of the Regional Authority Directorate. In their opinion, it was time to "change something" for improving performances at each hospital level and providing a better care service to the citizens. For this reason, they wish to introduce a management methodology suitable for both 1) increasing the quality of the service and 2) systematically solving problems. Learning from the successful Italian experiences[6] , the approach chosen was the lean healthcare management, in particular the application of the kaizen methodology. Differing from these existing experiences, the engaged Authority wished to introduce the kaizen *modus operandi* in the whole regional system from the beginning.

Rationale for research. As detailed in the previous chapters[7] this action project was expected to apply a Kaizen Initiative Program as a policy deployment framework from the first experience in different public hospitals. Insights to be provided regard: 1) a framework tested with 2) its features (*what*) and sequences (when) and 3) its process mechanisms (*how*). The action research was the scientific methodology chosen to investigate the organisational change.

For both perspectives, the success of the project and its outcomes was expected but not guaranteed (uncertainty of the project evolution). Thus, it was agreed that the inquiry of the action research and its cyclical steps will be rigorously guaranteed.

The researcher was recognized in her active role during the project by all the key actors belonging to the healthcare organisations involved. She worked together with professionals using the process consultation model.

Gradually, the expectations of each kind of stakeholder has been considered. Expectations collected are represented in Table 6.1.

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[6] Azienda Ospedaliera Universitaria Senese, Ente Ospedaliero "Ospedali Galliera" di Genova
[7] Chapter n. 2 Relevant Gaps and Research Questions and Chapter n. 3 Methodology of the Research

Table 6.1 Stakeholders Expectation

Stakeholders	Expectation
Regional Authority Directorate (System level)	At project level, success of the introduced management approach in terms of: Alignment between strategy and operations Motivation to proceed further Adherence to lean principles achieved Adherence to the kaizen methodology achieved Awareness of the kaizen methodology achieved Use and grasp of the A3-tool achieved
Top Management Middle Management (Hospital level)	At project level, success of the introduced management approach in terms of: Alignment between strategy and kaizen initiatives Motivation to proceed further Adherence to lean principles achieved Adherence to the kaizen methodology achieved Awareness of the kaizen methodology achieved Use and grasp of the A3-tool achieved Successful Kaizen Initiatives (first outcomes)
Operative Management (Kaizen team level – tutors)	Operational success of their Kaizen Initiatives in terms of: Rigorous use of the acknowledged tools achieved; Increase of fluent communication among professionals achieved; Consciousness of their processes; Analysis of the selected issue achieved; First little technical results achieved; Recognition of the efforts by the Top and Middle Management
Operative Management (Kaizen team level – team members)	Operational success of their Kaizen Initiatives in terms of: First Technical results generated by the actions realized; Consciousness of the patient flow and the care process; Proper use of the tools achieved (A3-tool and the others) Awareness of the kaizen methodology achieved Recognition of the efforts by the Tutor, the Top and the Middle Management

During the project actions, the inter-relationship among stakeholders were observed and gathered as well, especially the internal recognition system and the dynamics among levels and roles. Moreover, the researcher gathered data on the seven hospitals as reported in Table 6.2: hospital typology; areas of medical excellence, if pertinent; location (city or hinterland); number of employees; number of available beds; number of employees; number of users served, catchment area (inhabitants).

Table 6.2 Hospitals data

Data	Hospitals						
	H1	**H2**	**H3**	**H4**	**H5**	**H6**	**H7**
Typology: Private/public	Public	Public	Public	Public	Public	Public	Public
Location: City/Hinterland	C	H	H	C	C	C	**H**
Territorial Hub: Yes/No	Yes	No	No	Yes	Yes	No	No
Centre of Excellence Yes/No	No	No	No	No	No	Yes	Yes
If yes:	-	-	-	-	-	Paediatrics Gynaecology	Oncology
No employees	**4.300**	**3.252**	**2.214**	**5.205**	**3.796**	**700**	**628**
No. beds*:	**755**	**703**	**341**	**1185**	**657**	**161**	**130**
Ordinary	*676*	*646*	*311*	*1066*	*602*	*136*	*98*
Day Hospital	*79*	*57*	*30*	*119*	*55*	*25*	*32*
Users served	**122.671**	**128.058**	**86.134**	**131.812**	**159.500**	**-**	**-**
Catchment area *Inhabitant*	**300.000**	**80.000-150.000**	**80.000-150.000**	**300.000**	**300.000**	**Regional Extra-regional**	**Regional Extra-regional**

Source: Regional Authority – year 2016; No. beds*: year 2018

The researcher kept a journal for taking notes and observations during the whole action project. This instrument helped to meditate on the real time experience, to understand the organisational and relational dynamics occurring with the action.

After the research agreement with the Regional Authority, the action project was formally activated. Each process with its own tasks and the role of the action research are described in detail below. The figure 6.2 represents the expected time schedule of the plan, with main steps and milestones.

Figure 6.2 Preliminary Time Schedule

		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
		Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18
Process 1	Design and Support															
	1.1 Planning															
	1.2 Coordination															
	1.3 Dissemination of Results															
Process 2	Education															
	2.1 Strategy Communication															
	2.2 Orienting to Kaizen methodology															
Process 3	Training															
	3.1 Methodology and Tools Training															
	3.2 Transferring Knowledge Training															
Process 4	Kaizen Implementation															
	4.1 Preparation															
	4.2 Execution															

Milestones: USCm, USCm, USCm, USCm, USCm, USCm — Training, Training, Transferr, Transferr, Transferr. — P4 Start — P4 finish — Evaluation

TIMELINE

Figure 6.3 Process 1

Process 1 – Design and Support

This process consisted in three main sub-processes and were designed by the Umbrella Steering Committee (USC): Planning; Coordination, Results Dissemination. It covered the whole project duration from 20th July 2017 to 30th June 2018. Figure 6.3 details tasks per each sub-process. Planning and Coordination tasks were extremely interconnected.

The first meeting represented the kick-off of the project. It was organised for establishing the USC and designing an overall plan of the action represented. All the General Directors (or in alternative, their Delegate) were called by the Regional Authority. The researcher participated at this meeting. Following, each sub-process is described with its own tasks.
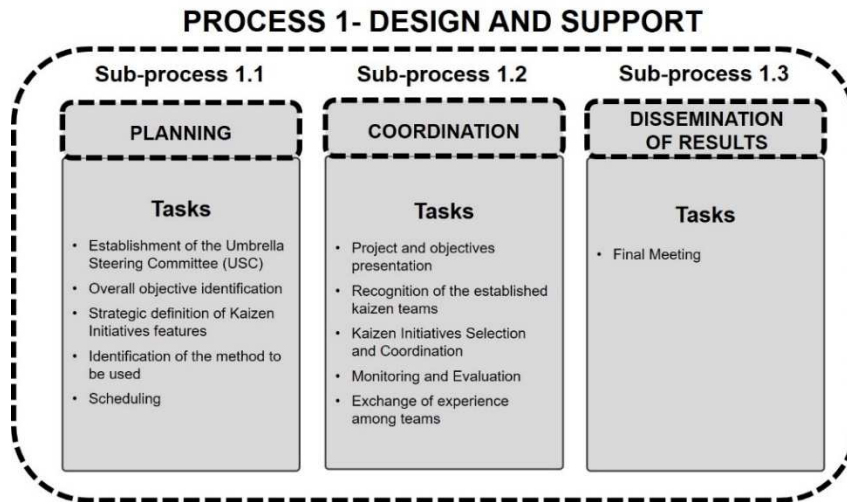
Planning

The Planning sub-process was articulated in five main tasks aiming to achieve a triad of objectives:

- to define the strategic goal of the project to be spread;
- to organise and coordinate the project by respecting an expected time schedule;
- to provide and share common rules and guidelines for implementing the project.

The five main tasks are detailed below.

Establishment of the Umbrella Steering Committee (USC)

The kick off was called for officially establishing the USC with its members. It included:

- n.2 representatives of the Regional Authority, as the Coordinator and the Executive Officer of the project;
- n. 7 General Directors of the hospitals involved or their Delegate;
- n. 1 Scientific Director from the university;
- n. 2 action researchers;
- n. 1 Secretary for organisation issues.

The USC played a crucial role of responsibility. It oversaw planning, coordinating and disseminating. It represented both the regional system and the hospital organisations as independent units. The USC planned all the activities and had discretion in evaluating

process or task modifications. It was the place of the decision -making process as well as of briefing, feedbacks and monitoring on tasks, behaviours, change climate, difficulties and achievements.

Overall objective identification

After its establishment, the USC had to identify the overall strategic objective to achieve within the project. The identification of this goal was fundamental for aligning all the organisations and professionals involved into the project. For this reason, USC members took a unanimous decision: to define two different but complementary targets, for getting a good alignment between the strategy level and the operative one: the strategic goal and the operative goal.

The **strategic goal** was defined as follows: to gradually introduce and apply the kaizen management approach in all hospitals belonging to the Regional Authority. This should help to:

- raise awareness of professionals on their processes (short/mid-term, within the action project);
- overcome organisational problems (short/mid-term, within the action project);
- increase the quality of the healthcare service provided (long-term, beyond the action project);
- use resources in a more efficiently way (long-term, beyond the action project);

The **operative goal** was focused on getting professionals to achieve a fluent competence of using the kaizen methodology and to be aware of its advantages for the conduction of daily operations.

Strategic definition of the main features of the Kaizen Initiatives

For facilitating the first kaizen experience, the USC decided to set some guidelines supporting the preparation phase of the implementation (Process 4). These key points could help kaizen teams to select processes 1) proportionate to the extent of the schedule envisaged and 2) appropriate to achieve the goals of the project. The guidelines are listed below in the Table 6.3:

	Guidelines for selecting processes
Alignment with organisational strategy	It is linked to the hospital strategy (focus on the topic)
	It responds to an emergent or felt issue (focus on the problem)
Characteristics of the process	Is simple to identify (delimited)
	Includes no more than 2 Departments or Units
Number of processes	At least 1, no more than 2 per hospital
Time to be invested	The process could be faced within the time schedule of the project

Table 6.3 Guidelines for selecting processes

Identification of the method to be used.

The USC decided to experience the implementation of kaizen as one of the methodologies of lean management. Starting from the characteristics of existing kaizen initiatives, the USC defined and shared some mandatory rules and some recommendations to be considered during the project (Table 6.4):

Table 6.4 Mandatory rules and recommendations

	Mandatory rules	Recommendation
Project	The kaizen initiative must follow a structured cycle of activities: Cycle of Deming (PDCA)	-
	The steps of the Cycle of Deming must be respected at all	-
Tool	The main tool to be used is the A3-Report as respects the PDCA Cycle	Complementary tools to be used within the A3-Report: Value Stream Map; Ishikawa Diagram; 5whys; 5S; Spaghetti chart;
Team	Team must be heterogeneous, including different roles working in the same process.	Maximum Size: 10 members
Focus	The process perimeter must be defined. The goal of the initiative must be clear	The goal must be measurable
Time	The length of time required to realize the kaizen is between 1 month (at least) and 6 months (at maximum).	Do not exceed the 6-month period

Project and tool

The common methodology chosen for realizing each kaizen initiative was the PDCA Cycle. This mechanism consisted in 4 main phases: Plan, Do, Check, Act. Each main phase included different tasks, as illustrated in Figure 6.4. Teams had to be adherent to these steps of action. A3-Report was the lean tool chosen for executing the improvement cycle. An example of this tool is shown in Figure 6.5:

Figure 6.4 Implementation methodology: PDCA Cycle

Figure 6.5 An example of the A3-report
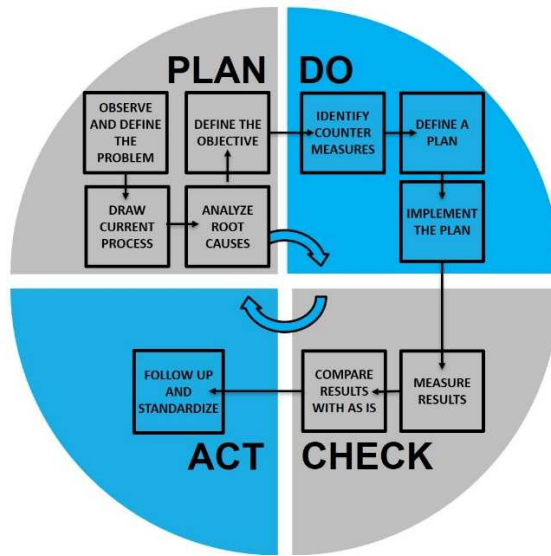

Moreover, some complementary tools were considered for facilitating the improvement projects:

- the Value Stream Map (VSM) and the Spaghetti Chart for analysing the current state of the process object of the kaizen initiative;

- the Ishikawa Diagram and the 5whys technique for reaching the root causes of the problems identified;
- the 5S technique for the reorganisation of the work place.

Team and focus

In healthcare, the success of an improvement process could be mainly achieved if the membership of the established team is heterogeneous. In fact, different figures (as physicians, nurses, care assistants and technicians) can express different perspectives by observing the same process. This is considered an added-value because it facilitates a complete comprehension of the emerged problems.

Time

A 5-month period was considered as an appropriate timeframe for executing a kaizen event and completing the PDCA cycle in each hospital. The execution phase was expected to start approximately in February 2018 and to finish in June 2018, at the latest. All these details were transferred during the training phase of the project.

Scheduling

The USC estimated a time schedule (Table 6.5) for the project to coordinate, monitor and evaluate the ongoing actions, and the transition from a phase to another.

Table 6.5 Operative time schedule

No.	Process	From	To	No. months
1	Design and Support	July 17	June 18	12
2	Education	July 17	September 17	3
3	Training	October 17	February 18	5
4	Kaizen	February 18	June 18	5
	Overall Project	**July 17**	**June 18**	**12**

The USC meetings were scheduled just before the transition from a process to the consecutive one or from a subprocess to the next one. This allowed to collect feedbacks after each action and to evaluate how to proceed respect to the expected plan. USC members worked in close contact and exchanged periodic feedbacks. Such exchange allowed to:

a. compare and understand the different circumstances among organisations and
b. prevent some delays due to personnel behaviour or difficulties occurred

Five meetings were planned with an estimated timeline as reported in Table 6.6:

Table 6.6 Estimated time schedule of USC meetings

Date	Transition	
	From	**To**
July 2017	Project Kick-off	
September 2017	Process 2	Process 3
December 2017	Sub-process 3.1	Sub-process 3.2
January 2018	Process 3	Process 4
June 2018	Process 4	Process 1 (Subprocesses 1.2 and 1.3)

Coordination

The Coordination was articulated in five main tasks (listed in Table 6.7) aiming to guarantee:

- a good conduction of each action, by respecting the expected time schedule and the main objectives of the project;
- a clear and flowing communication between the hospitals and the Regional Authority
- a clear and flowing communication between top managers and professionals across any organisation level.
- A continuous support to kaizen teams and hospitals.

Table 6.7 Coordination tasks

	COORDINATION
Tasks	- Project and objectives dissemination - Recognition of the established kaizen teams - Kaizen Initiatives Selection and Coordination - Monitoring and Evaluation - Exchange of experience among teams

The five main tasks are detailed below.

Project and objective presentation

The project was presented during the first USC Meeting to all General Directors of the hospitals belonging to the regional system. The aim was to involve immediately top managers and to make them aware about the relevance of the project proposal offered

by the Regional Authority. The content and the general objective of the project were explained by the members of the Regional Authority, with the support of the researchers. As agreed about the importance of a managerial change for improving the organisation of the regional healthcare system, responsibilities for the internal communication were distributed among the members of the USC, as detailed in the Table 6.8.

Table 6.8 USC responsibilities for the project dissemination

Activity	Responsible
Project official communication to the whole system	Regional Authority (the Coordinator, the Executive officer and the Secretary)
Communication within each hospital	n. 7 General Directors with their internal staff

The communication across each organisation was fundamental because General Directors could identify the personnel more interested in participating actively in the project.

Recognition of the established kaizen teams

For proceeding regularly, the established kaizen teams needed to be recognized by:

- the Top Management, to assign officially the kaizen membership;
- the Human Resources Office, for internal bureaucratic issues;
- the Department Head, for limiting or avoiding operative and/or behavioural barriers.

This recognition was realized at hospital level and then ratified at system level by the USC.

Kaizen initiatives Selection and Coordination

Selection. Kaizen initiatives were selected as following the guidelines set by the USC (Table 6.3). Firstly, each General Director considered the hospital strategy and the existing organisational issues influencing the value for the patient. Secondly, after the training, General Director debated with the trained personnel for jointly identifying the topic to deal with. Finally, the decision-making process on the specific issue identification was delegated to the kaizen teams. They were responsible of following the mandatory rules and the recommendation shared by the USC.

Coordination. Kaizen initiatives were coordinated at system level. Each team followed the same protocol for proceeding, even if belonging to different organisations. Teams respected the joint time schedule, the same procedural steps and used a common methodology, as described in Table 6.9. Each team had to realize its kaizen initiative respecting a fundamental rule: the kaizen project should start between January and March 2018 at the latest.

Teams were autonomous in their internal coordination (e.g. internal meetings, work organisation; tasks assignment per each member).

Table 6.9 Protocol for improvement

Time Schedule:	Time range to start the execution: from January to March 2018
	Month expected to finish the execution: June 2018
Count down steps to be followed:	Step 1: Kaizen initiative setting and A3-Report preparation Contents: perimeter and problem identification; Use of the transferred tools for the analysis. Suggested delivery deadline: End of February 2018
	Step 2: Identification of the objective and definition of the countermeasures. Design of the implementation plan with tasks, internal deadlines and responsibilities. Suggested delivery deadline: End of March 2018
	Step 3: Introduction of the countermeasures; Suggested delivery deadline: End of April 2018
	Step 4: Monitoring and results collection for the evaluation Suggested delivery deadline: End of June 2018

Monitoring and Evaluation

Three formal monitoring levels has been taken in action:

1. teams recommended to schedule periodic briefings with the action researchers to face properly each step of action (team level);
2. After team briefings, action researchers reported periodically the progress of work to each hospital director or delegate (organisation level);
3. Teams progress reporting during the USC meetings to jointly evaluate the ongoing activities and the potential difficulties (system level).

As monitoring, also the evaluation was divided in three main levels: system level, organisational level and team level. Such levels guaranteed gradual adjustments or additional support if requested.

Exchange of experience among teams

The exchange of experience among teams were enhanced by the USC in two different modalities: formal and informal.

Formal exchange. Taking place during the USC meetings. General directors compared their internal situations, together with the Regional Authority and the action researchers. This feedback was officially notified. Moreover, the final meeting was another opportunity to formally exchange results, perspectives and opinions.

Informal exchange. Teams were encouraged to compare their progress among each other and to discuss about difficulties or modalities of action. This kind of feedback helped team members to solve potential or occurred problems rapidly, but it was not traced.

Dissemination of Results

This sub-process aimed at sharing the results obtained among teams and professionals. A formal meeting was organised just before the end of the project. The event was public: any healthcare professional or interested person could participate.

The objective of the initiative was to present the experience and its results at system, organisational and team level. The event took place on the 14th June 2018, at the Regional administration headquarter.

This formal meeting allowed:

- each team to compare its kaizen project with the other ones and to note some development points for concurrent or further initiatives of improvement;
- hospitals managers to increase the knowledge about their processes;
- the Regional Authority to better understand the current state of each hospital and which difficulties are to deepen and which priorities are to be enhanced;
- other professionals to understand the kaizen mechanism and to think about potential improvements to be done.

Process 2 – Education

This process was articulated in three main sub-processes: Strategy communication; Orienting to kaizen methodology and Selection of potential team facilitators. This process lasted two months, August and September 2017.

The objective of this process was dual:

- To communicate the vision of the Regional Authority aiming at increasing the service quality provided to citizens in general;
- To present the managerial approach and the related methodology chosen to improve.

Strategy communication and orienting to kaizen methodology

A full-day educational training was organised by the USC for achieving the dual objective explained above. The strategy communication and the education on the kaizen methodology happened simultaneously.

The training programme was addressed to the Top Management and the Middle Management of each hospital belonging to the regional system. Their participation was strongly recommended with a personal invitation sent by the Regional Authority. In case of unavailability, they were suggested to appoint a delegate. Moreover, the participation was enlarged to the coordinators and to the other professionals. The number of participants is specified in Table 6.10.

Table 6.10 Participants per hospital and role

PARTICIPANTS	H1	H2	H3	H4	H5	H6	H7	TOTAL
Healthcare professionals	30	25	23	22	20	15	7	**142**
Other employees (non clinical)	7	5	6	7	10	7	2	**44**
TOTAL	**37**	**30**	**29**	**29**	**30**	**22**	**9**	**186**

The training was divided in two main sessions. The first session was conducted by the Regional Authority to present the project and to communicate the regional strategy, consisted in a mid-term objective and a long-term willingness.

The mid-term objective was to experience the kaizen managerial approach that could 1) link together the hospitals belonging to the regional system and 2) facilitate the alignment between strategy and clinical management at hospital level but also between hospitals and the regional administration.

The long-term willingness was to maintain this improvement approach for increasing both the hospitals and regional service performances in terms of quality provided to patients.

Selection of potential facilitators

After the education session, the second USC meeting was called to have a briefing and consequently organise the transition from the Education (Process 2) to the Training (Process 3). The agenda of the meeting is detailed in Table 6.11.

Table 6.11 Second USC Meeting Agenda

Date	USC Meeting goals to be achieved	Transition	
		From	To
22.09.2017	Briefing and Evaluation on the interest emerged from the education session addressed to Top Managers Proposal and definition of criteria to select potential kaizen team tutors Planning of the Process n. 3	Process 2	Process 3

General Directors affirmed that a positive interest emerged among participants during and after the seminar. In this sense, some criteria were considered to select the potential kaizen facilitators for the next training phase. These matched criteria are detailed in Table 6.12.

Table 6.12 Criteria for selecting facilitators

Personal criteria	Job description
The willingness to actively participate in the project, after the education day	Department Director/ Healthcare Profession Coordinator or one of their Delegate (trust relationship)
the proactive attitude	Dealing with strategical processes in the concurrent situation
A well-balanced character and a recognised leadership	

These criteria were ratified by the USC. Each General Directors were committed to respect them. It was faculty of each General Director to identified themselves as one of the facilitators. Facilitators were the professionals selected for the realisation of the project, but also for further proceeding with the methodology beyond the end of this project. In this sense, 20 facilitators were selected per each hospital.

Process 3 – Training

This process included two main sub-processes: 1) Methodology and tools training and 2) Training for transferring knowledge.

Expected Plan

This process was expected to last 5 months: from October 2017 to February 2018 included. It was designed by the USC during the second formal meeting in September, after the Education training (Process 2). The training architecture is illustrated in Figure 6.13:

Table 6.13 Training Architecture

Training	Description	Training modalities	Training hours
Sub-process 1 Methodology and tools	2-full-day training per n. 3 edition in which potential tutors are trained about: - the application of lean principles in healthcare; - the basic lean tools for kaizen: VSM and Swim lane; Spaghetti Chart; 5S, standard work; Visual management); - the formal problem-solving process: PDCA Cycle; - the A3-Tool for implementing the PDCA Cycle	Lecture session Practical session (team exercise) Share of experiences in the field	n. 3 editions of 14 hours. **Total: 42 hours**
Sub-process 2 Transferring knowledge	**First step:** 1 full-day training in which selected tutors could practice the transferring of knowledge of lean tools to a potential team. A participant could attend this session only if: - has attended the training of methodology and tools before; - was recognised as tutor by his/her boss.	Interactive session with training simulation. Participants involved in testing their confidence with the transfer of tools to their teams.	n. 1 edition of 7 hours. **Total: 7 hours**
	Second step: 1 full-day training per each hospital, in which each selected tutor transfers the kaizen methodology and the lean tools necessary to activate and implement a kaizen initiative (peer education). Beneficiaries of this training session are the members of the kaizen teams.	Lecture session Practical session (team exercise)	n. 1 full-day (7 hours) training per hospital. **Total: 49 hours**

Methodology and tools training

The training was organised in three editions. Each edition consisted in two full-day sessions with a standard programme. The sessions were dislocated in three different sites following the criterion of geographical proximity with hospitals to facilitate the participation. This allowed participants to choose the better location for attending the training edition. Each participant could enrol in only one edition.

Firstly, this training editions were addressed to the candidates for taking the role of tutors during kaizen initiatives. Secondly, the courses were opened also to the potential members of kaizen teams per each hospital (highly recommended by the General Directors). This process was expected to transfer the lean principles, the adherence of lean management to the healthcare and the basic tools necessary to undertake kaizen initiatives.

During these editions, the whole process of training was explained with its consequential tasks. The training period was expected to last from October 2017 to February 2018. The number of participants is explained in Table 6.14

Table 6.14 Participants per training edition

Training participation/Edition		H1	H2	H3	H4	H5	H6	H7	TOTAL/ ROLE	TOTAL/ EDITION
1st Edition (14h) October 2017	Healthcare professionals					15	1	12	28	44
	Other employees	1				12		3	16	
2nd Edition (14h) November 2017	Healthcare professionals		7	9	22				38	41
	Other employees			2		1			3	
3rd Edition (14h) November 2017	Healthcare professionals	16	8		1	2	11		38	42
	Other employees	4							4	
	TOTAL	21	15	11	23	30	12	15	127	127

The three training editions were realized in October and November 2017. The contents of the standard programme were divided in two full-day sessions, as detailed in Table 6.15:

Table 6.15 Contents of training sessions

Training Programme	
First full-day session	**Second full-day session**
- Comprehension of concepts: patient value and lean principles in healthcare - Adding value activities and non-adding value activities in a process - Basic tool for process mapping: Value Stream Mapping; - Case studies and VSM practice exercises - Discussion on practice - Kaizen Methodology: PDCA Cycle	- The Kaizen tool: A3-Tool - Basic tools for process analysis: Ishikawa Diagram, 5Whys - A3-tool practice exercise - Basic tool for organising the work place: 5S - Basic tool for visualisation: Visual Management - Team building and effective communication - Leadership and team working - Learning test

Transferring knowledge: the first route change.

During each course edition, the most of participants expressed some doubts about their ability to transfer the acquired knowledge to their teams after just a training edition. They did not feel completely comfortable to conduct autonomously a kaizen training course addressed to other professionals. They stressed this point many times, even if they understood the cultural approach and the tools explained through exercises and simulations.

For these reasons, participants asked action researchers to propose some different training options to the USC for: 1) providing some other examples of successful kaizen experiences in Italy and 2) supporting them before starting the kaizen projects.

Action researchers took notes and immediately reported the emerged requests to the Regional authority for finding a new solution. As the approximate planning, the third USC meeting was called at the beginning of December 2017 to first evaluate the training cycle and face the requests occurred. Details on this meeting are described in Table 6.16:

Table 6.16 Third USC meeting details

Date	USC Meeting agenda	Transition	
		From	**To**
1.12.2017	1. Evaluation of training and participants' feedback 2. Re-design of the Sub-process 3.2 *Transferring Knowledge Training*	Sub-process 3.1	Sub-process 3.2
	3. Substantial modification of the Process 4, as consequence of the re-design of the Subprocess 3.2: Kick off to be launched by each hospital in January.	Sub-process 3.2	Process 4

During the USC meeting the action researcher reported the results of the training (subprocess 3.1) to all members, summarized as follows.

Training characteristics mostly appreciated:

- Use of international case studies for confirming the efficacy of the lean methodology in healthcare;
- Detailed explanation of lean principles and characteristics of continuous improvement;
- Proposal of preparatory exercises and practical sessions for transferring tools in a facilitated manner;
- Enhancement of an active involvement of participants;
- The training format in 2 full-days multiplied in three editions;
- Leadership and team working topics.

Training weaknesses mostly highlighted:

- Participants asked for the explanation of Italian experiences to be compared with their ordinary contexts for a better understanding.
- It was asked to change the format of the second part of the training, replacing the peer education proposed (Sub-process 2) with other modalities. The participants did not feel confident with this type of knowledge transferring.

After a brainstorming among USC members, the action researchers proposed to change the plan for satisfying the participants needs, as introduced in Table 6.17.

After an organisational check, the proposal was ratified by the USC and communicated to the professionals involved at hospital level.

The re-designed training session was realized in December 2017, the 19th.

The participants were selected by the General Directors per each hospital, as official leaders of the future kaizen initiatives (to be activated in Process 4).

Table 6.17 Training Change proposal

3.2 Planned action	3.2 Change proposal
First step:1 full-day training Selected tutors practice the transferring of knowledge of lean tools to a potential team. *Training objectives:* - practicing how to conduct a training session on lean principles and kaizen approach - Learning the educational material provided	**Unique step: 1 full-day training (7 hours)** <u>Morning Session</u> Learning by doing: participants are divided in groups for practicing the use of tools provided through a simulation of a patient flow *Simulation objectives:* - proper use of the kaizen approach and of tools; - practice of team working; - presentation of a solution based on data. <u>Afternoon session:</u> Presentation of a kaizen experience in Italy by a healthcare professional Open discussion with participants
A participant could attend this session only if: - has attended the training of methodology and tools before; - was recognised as tutor by his/her boss. **Beneficiaries**: selected leaders for the first KI by the top management (4 to 6 per hospital) **Trainers**: n. 2 Action researchers	A participant could attend this session only if: - has attended the training of methodology and tools before; - was recognised as tutor by his/her boss. **Beneficiaries**: selected leaders for the first KI by the top management **Trainers**: n. 2 Action researchers
Second step: 1 full-day training per each hospital, in which each selected tutor transfers the kaizen methodology and the lean tools necessary to activate and implement a kaizen initiative. Beneficiaries of this training session are the members of the kaizen teams. **Format**: n. 1 full-day peer education per hospital **Total**: 7 hours/kaizen team = 49 hours **Trainers**: leaders selected **Beneficiaries**: members of each kaizen team	Any second step provided. In each hospital, the time dedicated for the peer education is translated in 7 additional hours of support during the kaizen implementation. **Format**: Additional training during the kaizen initiatives (if necessary) and support to kaizen teams **Trainers/Supporters**: action researchers **Beneficiaries**: kaizen teams

During the final brainstorming, some participants stressed the importance of a formal recognition of their role and of their future kaizen teams to work in a safeguarded situation, avoiding any kind of barriers. This aspect was significative for potential leaders to guarantee the success of kaizen implementation. The declared attention to a recognition system raised three main points to be considered:

1- the selected leaders' willingness to go further with the kaizen experience;

2- a high need of recognition to be provided by the strategy level;

3- in some hospital, the recognition system was not already finalised (critical point).

At the end of the training, facilitators communicated the Department or hospital ward identified for further selecting the process object of the kaizen implementation. The identification was finalised together with their top management. For selecting the proper process, the action researchers reminded participants of the recommendations provided by their General Directors and ratified by the USC.

The following table detailed the number of potential facilitators attending the training and the department chosen for the kaizen implementation (per each hospital). Further, the specific leader of the kaizen initiative to be activated was selected among them.

Table 6.18 No leaders and department per hospital

HOSPITAL	DEPARTMENT/AREA	FACILITATORS	
		Healthcare Professionals	Other Employees
H1	Transfusion Medicine	4	2
H2	Oncology	3	
H3	Territorial care	4	
H4	Emergency Medicine	6	
H5	Emergency Medicine	4	1
H6	Surgery	4	1
H7	Oncology	4	
TOTAL		29	4

Process 4 – Kaizen implementation

This process included two main sub-processes as highlighted in Figure 6.8: 1) Preparation and 2) Execution

Figure 6.6 Process 4

PROCESS 4- KAIZEN IMPLEMENTATION

Sub-process 4.1	Sub-process 4.2
PREPARATION	**EXECUTION**
Tasks	**Tasks**
• Identification of the specific work team • Identification of the initiative boundaries • Communication of implementation rules	• Kick off Meeting • Training Team • A3 methodology application • Check of improvement • Measuring and adjusting • Standardization
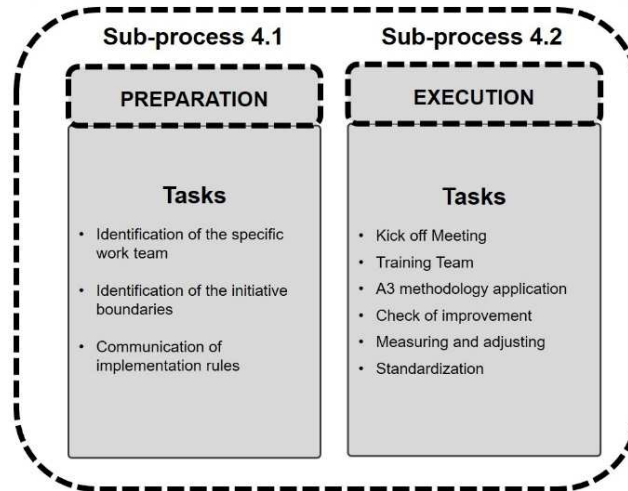
Expected Plan – second root change

This process was expected to last 5 months: from February to June 2018 included, as planned by the USC during the first meeting in July 2017. In fact, this process should have started after the knowledge transferring of kaizen through the peer-education among facilitators and kaizen team members. But, after the first root change (Sub-process 3.2), also this process was partially modified.

The kaizen process started a month before and teams had more time to activate the improvement initiatives. Moreover, each team could benefit from the additional support of action researchers on the kaizen field, rather than the peer-education support, considered as useless by professionals. These changes were formalised during the third USC meeting and confirmed further in the fourth USC meeting, as detailed in Table 6.19.

The kick-off of the Process 4 was launched in January 2018: General Directors officially communicated the formal mandate to kaizen teams for acting.

Table 6.19 Fourth USC Meeting

Date	USC Meeting goals to be achieved	Transition	
		From	To
25.01.2018	Communication of the official starting of kaizen Official formalisation of each kaizen project (topic, perimeter, official leader). Planning of an intermediate meeting for the exchange of experience and troubles occurred among teams and hospitals (peer-support)	Process 3	Process 4

During the meeting General Directors together with researchers reported: the progress status of the kaizen process (already started or not), the topic, the perimeter and the official leader. The status was not the same for the all hospitals. Just some of them already started the improvement projects, as detailed in Table 6.20

Table 6.20 Progress Status

	H1	H2	H3	H4	H5	H6	H7
Kaizen process launched Yes/No	Yes	No	No	Yes	Yes	No	No
No. Kaizen initiatives	2	1	1	1	1	1	1
Leader assigned officially Yes/No	Yes	Yes	Yes	No	Yes	No	No

Hospitals having already launched the process, have also finalised the preparation sub-process and encouraged the beginning of the kaizen execution. Moreover, the role of leaders was mainly assigned to medical directors or their delegates and to the directors of the departments engaged in the kaizen experience.

Hospitals that had not already officialised the kaizen process and the leader's assignment, were committed to proceed as soon as possible and to communicate it to the USC.

Considering the situation, researchers suggested to schedule an intermediate meeting among USC and kaizen teams, to have a clear picture of the general progress status before the end of the whole project. Thus, the meeting could facilitate the exchange among teams of common criticalities, feedbacks and potential solution to occurred problems. On the other hand, the USC and the General Directors could compare the different progresses and have in mind the concurrent situation.

This proposal has been accepted and the intermediate meeting was scheduled in April, two months before the conclusive meeting.

Preparation

This sub-process was articulated in three main tasks (listed in Table 6.21) aiming to guarantee a good setting of kaizen initiatives in each hospital. The preparation was activated differently among hospital: some organisation was faster than others. For this reason, the time range of this sub-phase could be identified from January to March 2018.

Table 6.21 Preparation tasks

	PREPARATION
TASK	- Identification of the specific work team - Identification of the initiative boundaries - Communication of implementation rules

Identification of the specific work team

Firstly, the work team was defined by the team leaders, after their official assignment by the top managers. Leaders and top managers had an exchange of views regarding the membership to be established, but the leaders were autonomous to identify professionals. Secondly, some of the facilitators non-assigned as leaders were involved in the team work for further support.

Thirdly, leaders and teams were officially recognised by the top managers.

Finally, each General Director or Delegate communicated the name of the leader and the kaizen membership to the USC.

Identification of the initiative boundaries

Leaders were supported by the top management to keep in mind the alignment with the hospital strategy. Focused on such alignment, kaizen teams defined autonomously the initiative boundaries, guided by the team leaders.

Teams were supported by the action researchers during the fulfilment of this task.

Despite the guidelines on the process provided (simple to identified and covering at most two departments or areas)[8], four out of eight teams decided to face organisation-wide processes in according with the top management.

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[8] Table 6.4 Guidelines for selecting processes

Communication of implementation rules

The implementation rules were defined and adjusted by the USC after the changes occurred during the Training processes. The ratified rules were officially spread to the kaizen teams by the General Directorate staff. Moreover, the implementation protocol was explained to leaders who had the responsibility to spread them to their staff.

Execution

This sub-process was articulated in six main tasks (listed in Table 6.22) aiming to guarantee a good setting of kaizen initiatives in each hospital:

Table 6.22 Execution tasks

	EXECUTION
TASK	- Kick off Meeting - Training Team - A3 methodology application - Check of improvement - Measuring and adjusting - Standardization

The execution tasks followed the mechanism of the kaizen methodology.

One kaizen initiative was launched per each hospital, except for H1 that activated two improvement teams. The hospital area, the topic and the objective are detailed in Table 6.23 per each kaizen initiative. It is also specified if the topic chosen concerns a transversal or specific process. A process is meant transversal if it passes through several clinical or administrative hospital departments and has a critical significance in the organisation. It can be also defined as an organisation-wide process.

A process is defined specific if it is circumscribed at most in three different hospital areas or wards (clinical or administrative). In other words, it is simpler to delineate its perimeter.

Table 6.23 Kaizen initiatives characteristics

KI Acronym	Hospital Area	Topic	Objective	Transversal /specific
KH1a	Transfusion Medicine	Blood donor flow	Waiting time reduction	Specific
KH1b	Transfusion Medicine	Outpatient blood sampling: flow reorganisation and waiting time	Waiting time reduction and re-organisation of the patient flow	Specific
KH2	Oncology	Scheduling CAT agenda reserved to oncology patients	Patient moving (steps) reduction	Specific
KH3	Territorial care	District Care Management for terminally-ill patients	Re-engineering of the patient flow charge by the district care	Transversal
KH4	Emergency Medicine	The patient flow from the Emergency Department to the District Care, passing through the General Medicine Department	Increase the beds management efficiency	Transversal
KH5	Emergency Medicine	Neurological patient flow in the Emergency Department	Reduction of the patient staying time in the emergency department	Transversal
KH6	Surgery	pre-operating process for the surgical patient	Patient flow and timing optimization	Specific
KH7	Oncology	Oncology patient medical report re-organisation	Increasing the efficiency of the medical reports management	Transversal

Details on kaizen team characteristics such as size, heterogeneity and leadership role are detailed in Table 6.24

Table 6.24 Kaizen initiatives characteristics

Hospital	No. KI	KI Acronym	Department Director	Physician	Head Nurse	Nurse	Clinical or IT	Technician	Administrat. Office	TOTAL	Leader
						Membership Setting					
H1	2	KH1a	1	2	1	-	1	-	-	5	Department Director (Transfusion Medicine)
		KH1b	2	1	-	3	2	1	1	10	Department Director (Sampling Centre)
H2	1	KH2	4		-	2	-	3	-	9	Medical Director
H3	1	KH3	1	4	1	2			2	10	Medical Director
H4	1	KH4		13	8					21	Health Profession Coordinator
H5	1	KH5	1	5	1			2	1	10	Department Director (Emergency Medicine)
H6	1	KH6	3	13	3	2	1	1		23	Medical Directorate Executive

H7	1	KH7	6	2		1		2	3	**14**	Medical Director

The kaizen teams were heterogeneous, and their size depended on the entity of data to be collected and of the related efforts such as work hours and availability of human resources. It happened that some of the team members did not attend the training editions.

The starting point of each kaizen initiative was formalized with a kick-off meeting and a focused 4-hour training was provided (if necessary) to team members who did not participated in the training phase. The action researchers provided the basic knowledge on kaizen methodology, transferring the problem-solving approach, the A3-tool and the complementary techniques for proceeding (VSM, Ishikawa diagram, 5Whys, 5S). Training was provided to H2 and H5 team members.

Action researchers supported all the kaizen teams during the implementation, especially at the critical transition from a PDCA step to another and during the decision-making process. Action researcher helped leaders and their team:

- to elaborate data in a logical and constructive manner;
- to observe dynamics in the processes, helpful to better understand data;
- to reflect about the events occurred through the main steps of the A3-report;
- to consider parallel solutions to the problems/difficulties identified.

Moreover, actioner researchers supported teams to monitor and evaluate results along the PDCA Cycle for avoiding misrepresentations.

The project in numbers

Details on the project performed are summarize below in Table

Table 6.25 Project summary

Project details	Data
Project time frame	14 months: 12m implementation + 2m evaluation
No hospitals involved:	7, belonging to a healthcare regional system
No. top/middle managers educated	195
No. professionals trained in the Sub-process 3.1 (basic tools training)	127
No. professionals trained during the Sub-process 3.2 (transferring knowledge)	33
No. professionals actively involved in the kaizen initiatives	102
No. kaizen initiatives activated	8
No. kaizen initiatives completed	3
No. hours of action researchers to train (action researchers)	68
No. formal meetings	6 formal meetings
No hours of action researchers to guide and support kaizen teams	400

CHAPTER 7

RESULTS ANALYSIS

Data collection

To answer the research questions, information was collected qualitatively in real time.

The researcher was supported by a colleague during the whole project.

Such support was to guarantee a rationale data gathering and a reliable data processing.

During the action, both researchers followed this procedure individually:

1. A diary was kept taking notes of events, dynamics and observations occurred in real time;
2. Notes were translated in a report, highlighting the concurrent method of inquiry and the learning history;
3. Action outcomes were detailed;
4. A self-reflection was made by each researcher on his/her own.

Secondly, the researchers compared their individual elaborations for finding reliable results. Specifically, they worked together for:

1. making a common reflection on the project story, highlighting the occurred modifications respect to the expected action plan;
2. extrapolating usable knowledge.

This second step allowed to produce a balanced debate and to avoid misrepresentations.

Methods of inquiry

Researchers used different methods of inquiry in the action. The modalities were different in accordance with the unfolding action steps, as detailed in Table 7.1 and Table 7.2:

Table 7.1 Methods of inquiry (Process 1 and Process 2)

	PROCESS 1		PROCESS 2	
Cuncurrent circustance	USC Meetings		Education edition	
Data gathering provider	Both action researchers and hospital managers		Action researchers	
Method of inquiry	Pure inquiry:	Confronting inquiry:	no specific inquiry occurred. Only neutral behaviour observation and listening	
Question type	Narrative questions: "Please, describe what happened?" "What is happening?" "What is going on"?	Sharing ideas: "What do you think if…?" "Have you considered if…?"	Not applicable	Not applicable
Process consultation modality	Firstly, reporting data gathered and acknowledgement of data gathered by key actors Secondly, facilitating feedback elaboration, enhancing problem solving, prompting to propose solutions		Reporting data gathered from the silent observation and listening	

Table 7.2 Methods of inquiry (Process 3 and Process 4)

	PROCESS 3		PROCESS 4	
Cuncurrent circustance	Training editions Informal talking after training editions		Kaizen team meetings Informal meetings	
Data gathering provider	Action researchers		Both action researchers and team members	
Method of inquiry	Confronting inquiry	Exploratory Diagnostic Inquiry:	Confronting inquiry:	Exploratory Diagnostic Inquiry:
Question type (e.g.)	Narrative questions: "Please, describe what happened" "What is happening?" "What is going on"?	"Why do you think it is happened?" "What did you do?" What ae you going to do?"	Sharing ideas: "What do you think if…?" "Have you considered if…?"	"Why do you think it is happened?" "What did you do?" What ae you going to do?"
Process consultation modality	Firstly, reporting data gathered and acknowledgement of data gathered by key actors Secondly, facilitating feedback elaboration, enhancing problem solving, prompting to propose solutions		Firstly, neutral observation and learning Secondly, stimulating talking and reflecting beyond a joint problem-solving orientation.	

Results

To target the research questions, results are classified into three main categories:

1. results at organisational level (hospital);
2. results at kaizen initiative level (kaizen initiative and kaizen team);
3. results at individual level (team leaders).

Each category of results is following detailed.

System level and organisational level results

The Kaizen Initiative Program (KP) was launched at system level and activated at organisational level in each hospital.
The KIP unfolding generated the following outcomes:

- architectural (regarding the KIP features and their sequence);
- procedural (regarding KIP dynamics and modalities);

Architectural results

To successfully launch and implement the continuous improvement approach, a policy deployment in healthcare needs to be supported by a sequence (when) of processes (what).

Processes as the key drivers for a kaizen successful implementation have been confirmed through the action research: Design and Support, Education, Training and Kaizen implementation.

It is emerged that Design and Support was transversal because it covered the whole project and it was continuously connected to the other processes. It was also dynamic because represented the decision-making process of the stakeholders involved (regional system and its hospitals). Moreover, this process represented the strategic hand of the kaizen implementation for planning, coordination and disseminating.

Education, Training and Kaizen Implementation were the operative processes meant to operate the strategic decisions made and to enact kaizen. These three processes respected a logical sequence: firstly education, secondly training and finally kaizen.

Education to the top and the middle management firstly, because they represented the hierarchical level meant to legitimize kaizen initiatives and to recognize kaizen teams. Thus, it was necessary to make them aware of the opportunity to 1) change for the better daily work and consequently 2) to improve the quality of the care service provided.

Training secondly, because it was necessary to transfer the basic competences and the basic tools before acting kaizen. Finally, kaizen to practice the continuous improvement. If these processes have been confirmed as main features of the KIP architecture, some of their sub-processes and tasks have been revised following the professionals needs and requests.

Firstly, the sub-process 3.2 - Transferring Knowledge Training - was modified as summarized in Table 7.3. Substantially, the expected peer-education among professionals was replaced with an advanced level of training and a further support during the kaizen implementation by the action researchers. The training programme was completely changed. This revision influenced the Kaizen process that was partially modified. Also, the duration of Training and Kaizen were modified.

It emerged that professionals did not feel confident in transferring tools just after a first training on kaizen.

Table 7.3 Transferring Knowledge Revision

	Expected Transferring Knowledge	Revised Transferring knowledge
Execution Modality	**n. 2 consecutive steps**	**n. 1 step**
Contents	**First step:** Practicing the knowledge transfer of lean principles and kaizen concept. 1 full-day training --------------------------------------- **Second step:** Peer-Education Trainee become trainers and transfer the basic concepts to their colleagues, members of the kaizen team activated 1 full-day training per each hospital	**First step:** Learning by doing: simulating a kaizen initiative in groups. Invitation of an expert in kaizen working in an Italian healthcare organisation. 1 full-day training --- **NO Second Step** In each hospital, the time dedicated to the peer education was translated in 7 additional hours of support during the kaizen implementation. The support was made by the action researchers

After this modification, hospitals had more time to activate kaizen initiatives because the training process finished a month before. Moreover, kaizen teams received more support by action researchers during the practical experience.

This itinerary modification was successful: action researchers provided more details on kaizen during the training and supported kaizen teams in practicing the methodology and in reflecting on the emerging situations.

Insights

Considering the architectural outcomes, the following insights (summarized in Figure 7.1) are provided:

1. policy deployment for continuous improvement in public hospitals could be successful if launched through a Kaizen Initiative Program;

2. a successful Kaizen Initiative Program should consider the following processes as key drivers (what): Design and Support, Education, Training and Kaizen.

Design and Support as the transversal process to plan, coordinate, monitor and evaluate the kaizen implementation. Education for involving the top and the middle management. Training for transferring the basic concepts and the basic tools to kaizen. Kaizen as the implementation of continuous improvement;

3. a successful Kaizen Initiative Program should respect a time sequence for acting the key drivers (when): 1) Design and Support; 2) Education; 3) Training; 4) Kaizen;

4. Training should be addressed directly to professionals assigned for kaizen teams, included leaders and facilitators.

Figure 7.1 Kaizen Initiative Program: the architectural insights
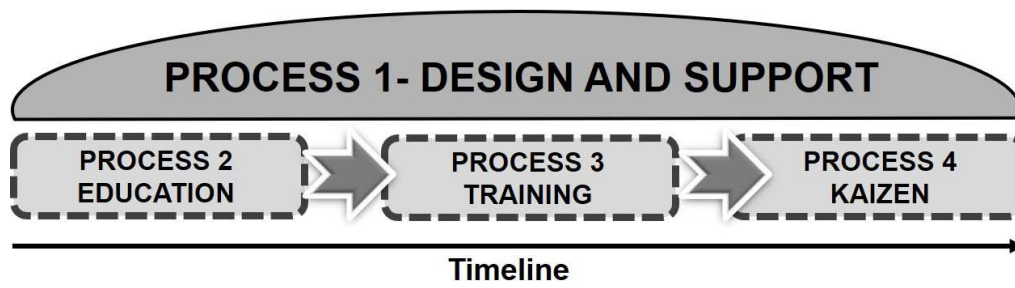
Procedural results

During the action project, it emerged that the policy deployment was a full-fledged process. Its management was crucial to trigger and coordinate the kaizen implementation within the hospitals engaged.

The establishment of a Regional Steering Committee (the Umbrella Steering Committee in the project) facilitated the joint planning and coordination among the main stakeholders: The Regional authority and its hospitals. Thus, membership included representatives of the Regional Authority and General Directors or Delegates from each hospital. The USC intervention was crucial to face the transition from a process to another, especially when some adjustments were requested by the professionals involved. The USC met formally 6 times during the project, as described in Table 7.4. Kaizen teams were invited to participate at two meetings, for presenting the progress status of their work.

Date	Meeting contents	Transition	
		From	To
22.09.2017	- Briefing and Evaluation on the interest emerged from the education session addressed to Top Managers - Proposal and definition of criteria to select potential kaizen team tutors - Planning of the Process n. 3 (Training)	Process 2 (Education)	Process 3 (Training)
1.12.2017	- Evaluation of training and participants' feedback - Re-design of the Sub-process 3.2 Transferring Knowledge Training	Sub-process 3.1	Sub-process 3.2
	- Substantial modification of the Process 4, as consequence of the re-design of the Subprocess 3.2: - Kick off to be launched by each hospital in January.	Sub-process 3.2	Process 4
25.01.2018	- Communication of the official launch of kaizen - Official formalisation of each kaizen project (topic, perimeter, official leader). - Planning of an intermediate meeting for the exchange of experience and troubles occurred among teams and hospitals (peer-support)	Process 3	Process 4
12.04.2018	- Intermediate evaluation of the kaizen initiatives (progress status and contents): presentation and discussion. - Kaizen teams invited as speakers	Sub-process 4.2	Sub-process 1.2 (task: Monitoring and Evaluation)
14.06.2018	- Evaluation of the kaizen initiatives (progress status and contents): presentation and discussion. - Kaizen teams invited as speakers	Sub-process 4.2	Sub-process 1.2 (task: Monitoring and Evaluation)
	- Dissemination of the kaizen experiences by each hospital under the supervision of the USC	Sub-process 4.2	Sub-process 1.3

The USC provided a managerial support to hospitals and teams for kaizen implementation. Such managerial support consisted in:

-   firstly, transferring clearly guidelines, rules and recommendations;
-   secondly, recognising the kaizen teams;
-   thirdly, considering doubts and difficulties expressed by professionals.

<u>Guidelines, rules and recommendations</u>

Guidelines transferred are summarised in Table 7.5; Rules and recommendations in Table 7.6.

Table 7.5 Guidelines for selecting processes

		Guidelines for selecting processes
1	**Alignment with organisational strategy**	It is linked to the hospital strategy (focus on the topic)
		It responds to an emergent or felt issue (focus on the problem)
2	**Characteristics of the process**	Is simple to identify (delimited)
		Includes no more than 2 Departments or Units
3	**Number of processes**	At least 1, no more than 2 per hospital
4	**Time to be invested**	The process could be faced within the time schedule of the project

Guidelines n. 1 and n. 3 were completely followed by the hospitals managers together with their kaizen team.

Guidelines n.2 and n. 4 were not followed by the all kaizen teams because the alignment with the organisational strategy prevailed over the ease of process identification. In fact, only one kaizen initiative (KH1a) faced a low complexity process, even if aligned to its hospital strategy. The others faced a medium or high complexity.

Table 7.6 Mandatory rules and recommendations

	Mandatory rules	Recommendation
Project	The kaizen initiative must follow a structured cycle of activities: Cycle of Deming (PDCA)	-
	The steps of the Cycle of Deming must be respected at all	-
Tool	The main tool to be used is the A3-Report as respects the PDCA Cycle	Complementary tools to be used within the A3-Report: Value Stream Map; Ishikawa Diagram; 5whys; 5S; Spaghetti chart;
Team	Team must be heterogeneous, including different roles working in the same process.	Maximum Size: 10 members

Focus	The process perimeter must be defined. The goal of the initiative must be clear	The goal must be measurable
Time	The length of time required to realize the kaizen is between 1 month (at least) and 6 months (at maximum).	Do not exceed the 6-month period

Rules on project, tools, team and focus as well as the tool and the focus recommendations were completely respected by each kaizen team.

The time rule was respected only by three teams (belonging to H1, H2 and H5). Thus, it happened because teams selected the processes in alignment with their hospital strategy and some of them were so complex to require more time and more efforts than expected. For these reasons, also the recommendation about the maximum size of teams were not always observed. In fact, teams belonging to H4 and H6 involved about 20 professionals in their teams because the process to be analysed were transversal. In other words, these processes were covering several departments and passing along the whole organisation. The time recommendation was respected but kaizen teams presented different levels of implementation at the final evaluation of the project.

Kaizen teams' recognition

Kaizen teams were formally recognised by both the USC and the top management of each hospital. Moreover, top or middle managers were active members of the kaizen teams.

Doubts or difficulties analysis

Doubts and difficulties expressed by professionals were immediately discussed and solved. The solution provide was directly communicated by General Directors to their kaizen teams.

Insights

Considering the procedural outcomes, the following insights for success emerged:

- Policy deployment should be considered as a process to be managed;

- In public healthcare, the very first policy deployment for continuous improvement could have more chance of success if launched by the healthcare authority to which the hospitals belong;

- Consequently, the establishment of a Kaizen Committee (as the Umbrella Steering Committee in the project) could be established for coordinating the policy deployment. It could guarantee the success of kaizen implementation. Such Kaizen Committee should be composed by the Representatives of the Healthcare Authority and the General Directors of the hospitals involved.

- Managers should consider first to align kaizen initiatives to the hospital strategy and secondly to define the number of kaizen initiatives to be activated.

- Kaizen teams should be recognised by managers to facilitate and safeguard their efforts against other professionals;

- It is successful to provide implementation rules to kaizen teams (e.g. the methodology and the tools to be used, modalities for membership selection)

- The active participation of department directors or coordinators could encourage teams to persist.

Kaizen initiative results

During the action project, eight kaizen initiatives (KI) were activated, at least one per each hospital. The characteristics of each kaizen initiative are summarized below.

Table 7.7 Characteristics of kaizen initiatives

	No. KI	KI ACRONYM	KI NAME	DEPART/AREA SELECTED	PROCESS SELECTED	PATIENT TYPOLOGY
H1	2	KH1a	Blood donor flow: waiting time reduction in the Blood Transfusion Centre	Transfusion Medicine	Blood donor flow	Blood donor
		KH1b	Outpatient blood sampling: flow reorganisation and waiting time	Transfusion Medicine	Blood sampling flow: from booking to service providing	Outpatient
H2	1	KH2	Scheduling CAT agenda reserved to oncology patients	Oncology	oncology ambulatory process for CAT reservations	Outpatient
H3	1	KH3	District Care Management for terminally-ill patients	Territorial care	Palliative care service process from hospital discharge to district service	Outpatient
H4	1	KH4	The patient flow from the Emergency Department to the District Care, passing through the General Medicine Department	Emergency Medicine	Patient flow from ED to the General Medicine, with a discharge to the District care	Inpatient
H5	1	KH5	Neurological patient flow in the Emergency Department	Emergency Medicine	Neurological patient flow (triage: green code)	Inpatient
H6	1	KH6	pre-operating process for the surgical patient: flow and timing optimization	Surgery	Paediatric and Gynaecology pre-operating flow	Day hospital patient
H7	1	KH7	Oncology patient medical report re-organisation	Oncology	Medical record path	Oncology patients

Cross Case Analysis – Progress Status

The kaizen initiatives were analysed focusing on their progress status respect to the PDCA Cycle (as the problem-solving methodology transferred to professionals). Firstly, eight steps of implementation were identified within the Deming Cycle:

5. current state process observation and mapping;
6. root-causes analysis;
7. specific objective definition;
8. countermeasures identification;
9. plan definition
10. plan implementation;
11. Results monitoring and evaluation;
12. Adjustments and standardization.

Secondly, each step was classified in relation to the level of implementation:

- Not started (the step has not been started);
- Ongoing (the step has been started and it is running);
- Started and completed (the step is completed;

Kaizen initiatives progressed differently and had also different durations. Therefore, the progress status was analysed considering two significative milestones: the intermediate evaluation (mid of April) and the final evaluation (mid of June). June 2018 was considered as the finish month to calculate the duration of each kaizen initiative, as highlighted in Table 7.8

Table 7.8 Kaizen initiative timeframe considered

	No. KI	KI ACRONYM	STARTING MONTH (included)	FINISH MONTH (included)	TIMEFRAME
H1	2	**KH1a**	January 2018	June 2018	6
		KH1b	January 2018	June 2018	6
H2	1	**KH2**	March 2018	June 2018	4
H3	1	**KH3**	March 2018	June 2018	4
H4	1	**KH4**	January 2018	June 2018	6
H5	1	**KH5**	January 2018	June 2018	6
H6	1	**KH6**	March 2018	June 2018	4

H7	1	KH7	March 2018	June 2018	4

The progress status of the kaizen initiatives is represented in Figure 8.1, considering both the intermediate and the final evaluation.

Figure 7.2 KIs level of implementation – intermediate and final
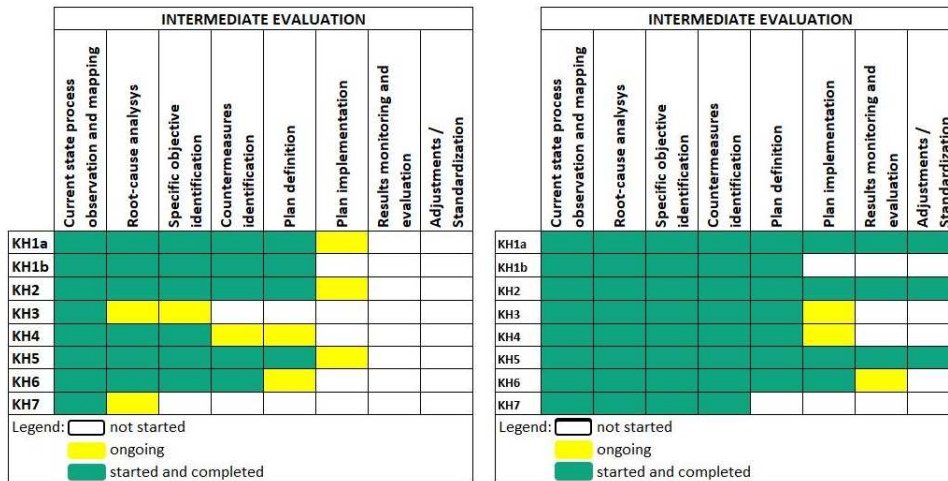
Kaizen initiatives were compared for understanding similarities or differences on the level of implementation. The independent variables used are:

- *the execution timeframe until June 2018.*

  The level of implementation was compared among initiatives with the same duration. Four kaizen initiatives lasted 4 months and the others had a 6-month duration.

- *the process complexity*.

  The level of implementation among initiatives was compared in respect to the level of complexity of the process selected. The complexity was defined considering how many hospital wards were included in the process, as reported in Table 7.9

Table 7.9 Level of complexity

DESCRIPTION	LEVEL OF COMPLEXITY
The process includes/pass through only 1 hospital ward or department	1 – LOW
From 2 to 3 hospital wards or departments are engaged in the process	2 – MEDIUM

More than 3 hospital wards or departments are concerned in the process	3 - HIGH

Time frame comparison

Kaizen initiatives with the same duration were compared, as identified in Figure 7.2 and 7.3

Figure 7.3 Comparison of 4-month KIs

It emerged that kaizen initiatives revealed a different level of implementation, even if the timeframe at the final evaluation event was the same. Regarding the 4-month kaizen events, it has been noticed that:

- KH2 completed all the implementation steps;
- KH3 completed steps up to the plan definition and started with its implementation;
- KH6 was proceeding with the monitoring and evaluation actions;
- KH have not still started the plan definition.

Figure 7.4 Comparison of 6-month KIs

Focusing on the 6-month kaizen events, it merged that:

- KH1a and KH5 completed all the implementation steps;
- KH1b completed steps up to the plan definition and started with its implementation;
- KH4 was proceeding with the plan implementation;

To compare kaizen initiatives in a more reliable manner, it was necessary to consider the level of complexity occurred.

Complexity comparison

Firstly, complexity was classified considering the number of areas involved in the processes analysed, as detailed in Table 7.10

Table 7.10 Kaizen initiative/Complexity

KI Acronym	No. Wards / Department	Description	Level of Complexity
KH1a	1	Transfusion Medicine (Donor)	low
KH1b	3	Centralized Booking Centre, Blood sampling Centre. Laboratory of Analysis	medium
KH2	3	Centralized Booking Centre, Radiology, Oncology	medium
KH3	3	Territorial Care Centre, Family Doctor system, Territorial Care Assistance, Oncology	high
KH4	4	Medical Directorate, Emergency Department, General Medicine, Territorial Service Care	high
KH5	4	Emergency Medicine, Neurology, Radiology, Sampling Laboratory	high
KH6	3	Paediatrics Surgery, Gynaecology Surgery, Anaesthesia Department	medium
KH7	5	General Directorate, Clinical Department, Oncology, Administrative Department, Research Department	High

Secondly, KIs levels of implementation at the final evaluation were compared in terms of complexity, as described in Figure 8.2

Figure 7.5 Level of complexity vs Level of implementation

	FINAL EVALUATION								% implementation progress (steps completed)	% implementation progress (ongoing steps)	% implementation progress (steps not started)	Level of Complexity
	Current state process observation and mapping	Root-cause analysys	Specific objective identification	Countermeasures identification	Plan definition	Plan implementation	Results monitoring and evaluation	Adjustments / Standardization				
KH1a									100%	-	-	low
KH1b									63%	0%	38%	medium
KH2									100%	-	-	medium
KH3									63%	13%	25%	high
KH4									63%	13%	25%	high
KH5									100%	-	-	high
KH6									75%	13%	13%	medium
KH7									50%	50%		High

Legend: □ not started
☐ ongoing
☐ started and completed

KIs completing all implementation steps (KH1a, KH5 and KH2).

KH1a and KH5 lasted 6 months and completed the all steps of Deming Cycle.

KH1a faced a low complexity, because the process analysed and improved concerns only one hospital area. Moreover, the professionals dealt with the same work place and were supported by a clinical Engineer.

KH5 complexity was high because included different hospital areas. Professionals belonged to different work areas but were dealing with the same kind of patient: the emergency patient. Probably, such circumstance facilitated the conduction of the kaizen activities.

KH2 completed the all steps in 4 months, even if were facing a medium complexity.

The common characteristic of these kaizen initiatives is the technical objective: process time reduction through the removal of non-adding value activities.

KIs completing steps up to the plan implementation -included – (KH6)

KH6, dealing with a medium complexity in a 4-month timeframe, achieved completely steps up to the implementation plan and was proceeding with the monitoring of results. This project involved several professionals dealing with different surgery disciplines and

this required more time to coordinate the team and to guarantee a complete debate with all of them. Also, this kaizen initiative aimed at reducing the length of stay of surgery patients during the pre-operative exams.

KIs completing steps up to the plan definition -included – (KH3, KH4 and HK1b)

Both KH3 and KH4, even if with different timeframe (respectively 4 months and 6 months) achieved finally only the plan definition and were proceeding with its implementation. The complexity was high, and teams had a common peculiarity: the process selected passed through both the hospital dimension and the territorial care service. Moreover, professionals involved were dealing with different sides of the chosen thematic. Both initiatives faced respectively two of the strategic challenges of their current health system: the treatment of oncology terminal patients and the care of the ageing patient passing from the acute care in hospital to the chronic care through the territorial assistance.

KH1b, facing a medium complexity and using a 6-month timeframe, achieved completely only the steps up to the plan identification and did not started the further phase. In this case, some of the professionals dealing with the selected process did not participated actively in the kaizen initiative and this situation creates some delays in the implementation phase.

KI completing steps up to the countermeasures identification -included – (KH7)

KH7 faced a high complexity challenge because the process selected was transversal and strategic respect to the whole hospital: the archive re-organisation of the clinical records. The timeframe available consisted in 4 months. The team achieved steps up to the countermeasures identification and did not started the further phase. In this case, some of the professionals dealing with the selected process did not participated actively in the kaizen initiative and this situation creates some delays in the implementation phase. Moreover, the identification of the agreed objective was a time-consuming.

Cross Case Analysis – Team size and heterogeneity

Kaizen teams were analysed considering their size and their heterogeneity (Table 7.11).

Table 7.11 Kaizen initiatives characteristics

Hospital	No. KI	KI Acronym	Membership Setting								TOTAL	Leader
			Medical Director	Department Director	Physician	Head Nurse	Nurse	Clinical/IT Engineer	Technician	Administrat. Office		
H1	2	**KH1a L**		1	2	1	-	1	-	-	**5**	Department Director (Transfusion Medicine)
		KH1b M		2	1	-	3	2	1	1	**10**	Department Director (Sampling Centre)
H2	1	**KH2 M**	1	3		-	2	-	3	-	**9**	Medical Director
H3	1	**KH3 H**	1		4	1	2			2	**10**	Medical Director
H4	1	**KH4 H**			13	8					**21**	Health Profession Coordinator
H5	1	**KH5 H**		1	5	1			2	1	**10**	Department Director (Emergency Medicine)
H6	1	**KH6 M**		3	13	3	2	1	1		**23**	Medical Directorate Executive
H7	1	**KH7 H**	1	5	2		1		2	3	**14**	Medical Director

The team size was different among kaizen initiatives. The researchers classified kaizen teams into three categories considering two thresholds: teams up to 5 members; teams up to 10 members and teams over 10 members.

Teams up to 5 members. Only a team belongs to this category: KH1a. The kaizen initiative needed a limited staff because the selected process covered only a department.

Teams of 6 to 10 members. Four teams belong to this category: Two of them were facing a medium complexity (KH1b; KH2). This threshold was good to face a medium process complexity.

Two teams composed by 10 members (KH3 and KH5) were defined as outlier: they were facing a high level of complexity. KH3 and KH5 faced their complexity with a limited staff because the leader decided to involve a representative per each role and per each work area for avoiding miscommunication and misunderstanding.

Teams over 10 members.

Three teams were composed by more than ten members, between 14 and 23 professionals. Two of them faced a transversal process with a high level of complexity (KH4 and KH7). In these cases, leaders decided to involve the all positions dealing with that processes to facilitate the data gathering.

KH6 was the outlier because faced a medium level of complexity with a numerous staff. This leader's decision was justified by the process peculiarity: it covered a department with different surgery specialties and it was necessary to involve all of them to understand data and organisational circumstances.

Cross Case Analysis – Leadership

Kaizen initiatives were all guided by a top or middle manager.

KH2, KH3 and KH7 were led directly by the Medical Director (top management).

KH6 were guided by a Delegate of the Medical Director. The others (KH1a, KH1b; KH4; KH5) were led by a Department Director or his/her direct Delegate (middle management).

In seven cases, leaders had a good attitude on guiding and involving their staff and were recognised by their team.

Among other, KH5 is significant because the team completed the whole PDCA Cycle even if it was facing a high level of complexity. This goal was achieved thanks to 1) a strong and engaged leadership and 2) a close work among professionals belonging to different departments.

In only one case (KH4) the leader was not recognised by all members and cannot completely guide the team. This criticality was overcome thanks to the team engagement on achieving the declared goal. Moreover, some members supported the leader to coordinate and proceed with the activities.

Cross Case Analysis – Team Autonomy

All kaizen teams were autonomous to proceed with the kaizen methodology. After the training and the joint decision on the topic with the top management, teams organised their work and made decisions. They were supported by the top management if requested.

Cross Case Analysis - Goal clarity

All kaizen teams clarified their initiative goal. The time effort necessary to jointly define the goal was different per each team. Also, in this case, such efforts depended on the level of complexity over than the time availability and the team size.

Teams facing transversal processes (high complexity) as KH3, KH4, KH5 and KH7 employed more time than the others to clarify the goal. In fact, the Plan step of the Deming Cycle was more time-consuming for these kaizen teams than the others: it lasted about three months. Anyway, only KH5 completed the improvement process thanks to the strong leadership and strong engagement of the leader.

Individual level results

Results at individual levels were analysed considering: 1) the team leaders' perspective on the experienced kaizen initiatives and 2) the top managers' perspective on the kaizen initiative program deployed.

Team leaders' perspective

During the final meeting of the project, team leaders were interviewed.

Action researchers conducted an unstructured interview to explore the perspective of team leaders regarding two main topics: 1) the lessons learnt during the kaizen experience; 2) the expectations for the future

Following, a summary of the responses is detailed per each team leader:

Table 7.12 lessons learnt and expectations

Team leader	Lessons learnt	Expectation for the future
KH1a	The use of a scientific approach to measure performances represents an added value for healthcare professionals The active involvement of the staff allowed to success	To improve more our process To activate other initiatives
KH1b	Data analysis is necessary to make reliable decisions The PDCA cycle allow professionals to face problems in a structured and logical manner	To promote kaizen as the organisational mindset To activate other initiatives
KH2	To simplify the patient staying is not impossible Process vision vs Functional vision System perspective vs Department perspective To quantify phenomena is necessary to elaborate effective strategies Kaizen for facing both clinical and managerial issues	This kaizen experience is only the beginning: To promote kaizen as the organisational mindset To apply kaizen to other more complex processes
KH3	Some initial difficulties to approach the methodology but it helped the communication among different areas and professionals.	To finalise the ongoing kaizen initiative. To activate other kaizen initiatives.
KH4	Kaizen methodology provides a process perspective rather than a functional perspective. It makes professionals aware about the process. Analysis Vs Perception The kaizen initiatives enhanced the communication among professionals belonging to different departments but crossed by the same process.	To proceed with this kaizen initiative To apply the methodology to other strategic processes
KH5	The importance of gathering data to understand processes and to deploy shared solutions. Kaizen provides a structured modality to face problems and to improve performances. The methodology involved directly professionals	To apply this methodology to other patient flows or processes for improving performances

KH6	Difficulty to coordinate different specialties matching with the same services Proposal are made by involved staff and the kaizen methodology evidences this aspect Solutions based on data analysis vs solutions based on perception	To optimise other processes
KH7	Kaizen methodology is useful to face different kinds of problems.	To finalise the ongoing kaizen initiative. To activate other kaizen initiatives.

It also emerged that kaizen initiatives facilitated the discussion among professionals, avoiding the organisational hierarchy. Communication was facilitated, and data analysis allowed staff to understand that most of the perceptions do not represent the process reality.

Top managers' perspective

Top managers were interviewed jointly as members of the established Regional Steering Committee. Interviews were performed by the action researchers in June 2018, after the final meeting. Such exploratory interviews were conducted with a semi-structured format using questions provided by Glover et al. (2013) as guidance.

The aim was to explore managers' perspective on the policy deployment launched and performed. Jointly responses were coded and summarized in detail in Table 7.12

Table 7.13 Manager's perspective on the policy deployment

ITEM	GUIDING QUESTIONS	JOINTLY PERSPECTIVE
OVERALL SUCCESS	*To what extent are kaizen events viewed as a success in your organization?*	Success is meant as: 1. having a common managerial method providing: firstly, a process vision instead of a sectorial vision; secondly a system perspective against a department perspective; 2. allowing professionals to improve autonomously their work and process due to a problem-solving technique; 3. work improvement translated in better work environments and better-quality service
MEASURED BENEFIT	*What types of measurable benefits/results have you realized from kaizen events?*	Measurable benefits were different respect to the progress status and typology of kaizen initiatives: - technical benefits as waiting time reduction, patient steps reduction; saturation medical exams booking to

|		respond to patients' demand (completed kaizen initiatives)
		- data analysis benefits: awareness on how complex processes are working as the base for improvement (ongoing kaizen initiatives).
SOCIAL BENEFIT	*What types social benefits have you obtained?*	The following social benefits were jointly considered: - strong commitment of teams to solve problems in their processes; - problem-solving attitude enhanced; - morale increased and generated willingness to go further; - team working attitude encouraged and improved.
EVENT PROCESSES TARGETED	*What are the major types of processes in which kaizen events have been conducted?*	8 kaizen initiatives were aligned to the organisational strategy. Interviewed classified them considering the topic chosen: - n. 2 KI faced processes involving the Emergency Department; - n. 3 KI faced processes dealing with oncology patients; - n. 2 KI faced processes regarding the blood sampling laboratories (outpatient and donors); - n. 1 faced the surgery processes.
ADOPTED TOOLS	What was the advantage for teams to adopt the same tools?	Managers agreed on the usefulness of having a common technical language. Communication and feedbacks among professionals and among teams were facilitated due to the use of a common kaizen protocol and of the application of the same tools.
ADOPTED PRACTICES AND AVAILABLE RESOURCES	*What were the practices and resources for kaizen events?*	Managers reported the practices most appreciated by kaizen teams: - training and the modification of training assets to satisfy professionals needs; - managerial support; - selection of KI aligned to strategy; - facilitation and support during the kaizen implementation Resources used for the project were essentially the time availability of human resources and their labour costs.
SUSTAINABILITY MECHANISMS	*What mechanisms do you have in place to sustain kaizen event outcomes?*	All managers expressed the willingness to go further and to activate gradually other kaizen initiatives by respecting the scheme provided during the project: sequence of phases and linkage between strategy management and kaizen implementation.
GENERAL PROBLEMS	*Was there any problem with events?*	Managers reported the following problems occurred: 1. Related to human resources. At the beginning, the problem was the resistance to change of professionals trained: they were worried about the success of kaizen initiatives that could be impeded by some personnel behaviour. For this reason, they asked strongly a recognition of leaders and teams. 2. Implementation problems: needed more time to gather and analyse data to understand process (especially the more complex ones) and sometimes initial results were

		not confirmed by numbers (e.g. change of communication standards among professionals)

Source: adapted from Glover et al. (2013)

CHAPTER 8

DISCUSSION

In this chapter, the discussion of results is provided to target the research questions (Figure 8.1).

Figure 8.1 Research questions
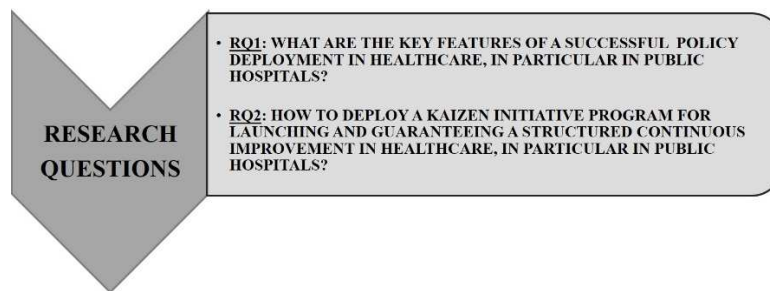
RQ1. What are the key features of a successful policy deployment in healthcare, especially in public hospitals?

To address this first research question, a theoretical framework adapted from the literature (Van Aken et al., 2010) was tested. Such theoretical framework was firstly meant to be a Kaizen Initiative Program (KIP): a structured policy framework applied for systematically implement kaizen initiatives and thus to introduce a permanent change in selected processes, complying with lean principles and aligning operation goals with the organisational policy.

Thus, the meaning of successful policy deployment is twofold:

- firstly, refers to the launch of a long-term kaizen perspective by overcoming the cultural resistance;
- Secondly, to sustain kaizen policy deployment over time.

Object of the action research was a group of seven Italian public hospitals, belonging to a regional healthcare system. For them it was the first approach to kaizen methodology as the first experience of a kaizen initiative program. The launch and the implementation

of the KIP was led by the Regional Authority with a strong attention to the alignment between hospitals strategy and daily operation targets.

The researchers investigated the organisational change and were actively involved in each phase of the project as the action research requires.

This research confirms that a Kaizen Initiative Program is needed to launch successfully a structured policy deployment for continuous improvement in public healthcare. Specifically, propositions based on the results analysis are provided. Such proposition concerns the first research question: the architectural features (what) and the temporal sequence (when) of a Kaizen Initiative Program are discussed.

Proposition on the architectural features

Based on the architectural results achieved, the following proposition are presented:

PROPOSITION 1A: a successful policy deployment for continuous improvement in public hospitals could be launched through a Kaizen Initiative Program.

PROPOSITION 1B: A successful Kaizen Initiative Program should consider the following processes as key drivers (what): Design and Support, Education, Training and Kaizen.

PROPOSITION 1C: the successful launch of a Kaizen Initiative Program should respect a time sequence for acting the key drivers (when): 1) Design and Support; 2) Education; 3) Training; 4) Kaizen.

The research confirmed that a structured guidance for applying a long-term kaizen perspective encourages:

- The activation of kaizen initiatives selected in accordance with the hospital strategy;
- The linkage between strategic level decisions and continuous improvement actions at operative level.

The confirmed Kaizen Initiative Program with its main key features is presented below in Table 8.2. Grey cells highlight a revision respect to the theoretical framework.

Table 8.1 Tested Kaizen Initiative Program: key features

| Process	Sub-processes	Tasks of sub-processes
1 **Design and Support**	*Planning*	Establishment of the Umbrella Steering Committee (USC) Overall objective identification Strategic definition of the main features of the Kaizen Initiatives Identification of the method to be used. Scheduling
	Coordination	Project and objectives dissemination Recognition of the established kaizen teams Kaizen Initiatives Selection and Coordination Monitoring and Evaluation Exchange of experience among teams
	Dissemination of results	
2 **Education**	*Communication of the long-term strategy* (one-year kaizen)	
	Orienting to kaizen methodology	
	Selection of potential team leaders	
3 **Training**	*Methodology and Tools Training*	Transferring basic lean tools
	Transferring Knowledge Training	Training for practicing
4 **Kaizen**	*Preparation*	Identification of the specific work team Identification of the initiative boundaries Communication of implementation rules
	Execution	Kick off Meeting Training Team A3 tool methodology Application Check of improvements Measuring and adjusting Standardizing new working behaviours

The action study revealed that:

- **Design and Support** is meant as a process running along the policy deployment. It is conceived to plan, coordinate, monitor and evaluate the kaizen implementation at strategy level. This process is necessary to give a robust and clear track to kaizen.
- **Education** is needed to involve the top and the middle management as powerful professionals.
- **Training** for firstly transferring the basic kaizen concepts and tools and then for practicing with simulation practices. Moreover, training should be addressed directly to professionals assigned for kaizen teams, included leaders and facilitators. The proposed peer-education among professionals were not appreciated, as it was the first approach to kaizen.

- **Kaizen** as the implementation of selected kaizen initiatives, linked to the hospital strategic goals.

Design and Support could be defined as the umbrella process for the launch and support of the kaizen initiative program. On the other side, Education, Training and Kaizen are the operative processes to deploy the kaizen policy.

The proper sequence of processes (when) investigated during the action research is represented in Figure8.2. Such sequence should be respected to launch successfully the policy deployment for continuous improvement.

Figure 8.2 Sequence of KIP processes
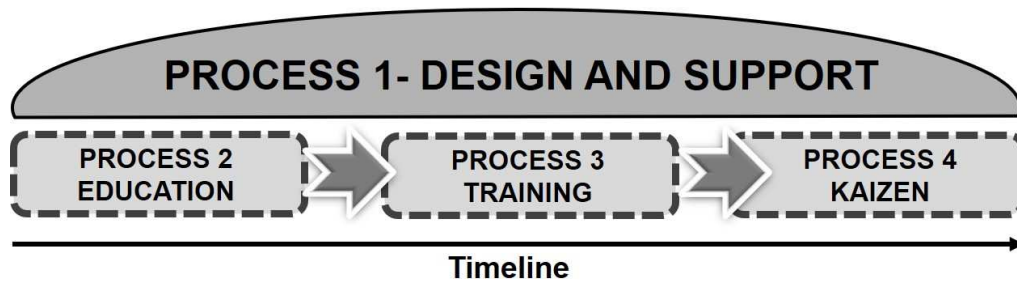
Propositions 1A, 1B and 1C target the RQ1 and specifically contribute to fill the relevant gap n. 4 (No scientific clarity on what a Kaizen Program should be in healthcare) and the gap n. 5 (no fully comprehension in practice on what a Kaizen Program should be in a healthcare context).

RQ2. **How to deploy a kaizen initiative program for launching and guaranteeing a structured continuous improvement in healthcare, especially in public hospitals?**

To address this second research question, the action researchers observed the dynamics activated through the application of the Kaizen Initiative Program for policy deployment.

Proposition on the procedural features

Based on procedural results achieved, the following proposition are presented:

PROPOSITION 2: Policy deployment should be considered as a process to be managed to successfully launch and sustain continuous improvement.

This proposition confirms the contribution from Witcher and Butterworth (2001). The authors affirmed that the policy deployment mechanism should be designed and managed as a process and that it is needed to activate a monitoring system to make it reliable, as also stressed by Naik et al. (2011) and Ng et al., (2010).

PROPOSITION 3A: In public healthcare, the very first policy deployment for continuous improvement has chance of success if launched by the authority to which the hospitals belong;

PROPOSITION 3B: Consequently, the establishment of a Territorial Kaizen Committee could sustain the policy deployment and guarantee the success of kaizen implementation.

PROPOSITION 3C: A successful launch of a kaizen policy deployment applies a participative approach.

It emerged from the study that the engagement of both the territorial authority and the top managers was crucial to launch successfully a policy deployment for continuous improvement in public hospitals. It is needed their powerful to move professionals towards the organisational change. Moreover, a Steering Committee was established to guarantee the deployment of the KIP and the engagement of top managers. It was made up of the Regional Authority representatives and by each hospital General Director. This
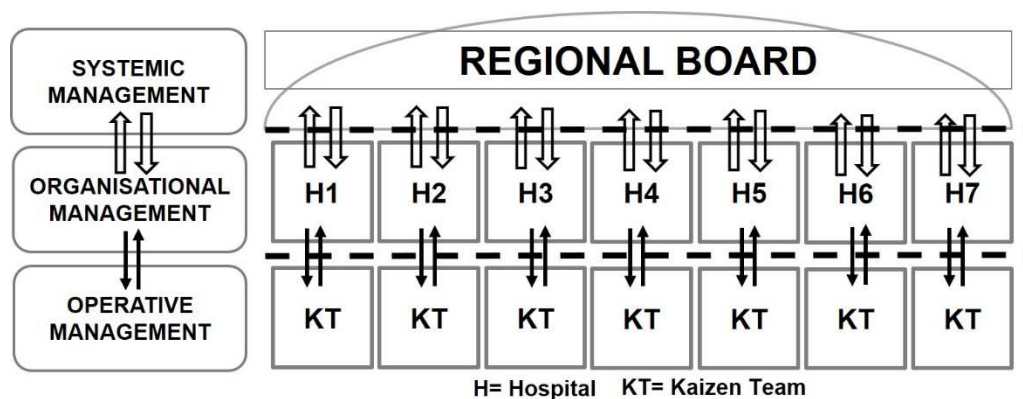
Committee guided the policy deployment due to a structured management system and through a participative approach. In fact, healthcare professionals were:

a) actively involved to identify the topics to be faced in their organisations together with their managers;

b) executed the kaizen initiatives autonomously.

The structured management system consisted in three levels (as illustrated in Figure 8.3):

1   The systemic management;

2   The organisational management;

3   The operative management;

Figure 8.3 Policy deployment concept at systemic level

The systemic management represented the linkage between the Regional Authority and its hospitals. Its board was the Steering Committee. It oversaw and supported the policy deployment at systemic level. Periodically such Steering Committee organised meetings to monitor the progress status of the policy deployment at systemic and hospital level.

The organisational management represented the alignment between each hospital strategy and its kaizen initiative. Top managers were in charge of supervising and supporting the selected kaizen teams. Kaizen teams reported periodically their progress status to the strategy level.

The operative management were the executive of the kaizen initiatives. Team leaders guided teams to achieve the expected improvement through a systematic modus operandi: the PDCA Cycle. Kaizen teams met regularly to proceed with the actions.

Propositions 3A, 3B and 3C provide a response to the first element of the second research question on the launching phase of the kaizen initiative program and partially contribute to fill the relevant gap n. 6 (Lack of knowledge on how a Kaizen Program should be deployed in healthcare). Such partially contribute is justified by the characteristics of the action project. It investigated the first year of policy deployment (launch and implementation).

PROPOSITION 4: The Kaizen Initiative Program represents the structured and systemic level of continuous improvement in a public healthcare system.

It is demonstrated that:

- the Kaizen Initiative Programme performed and practiced as the second level of the Continuous Improvement Evolution provided by Bessant and Francis (1999);
- the learning process could start from the level 2 (structured and systematic CI) of Bessant and Francis's scale (1999) due to the deployment of a KIP. Thus, level 0 and Level 1 could be skipped.

Performances and practices confirmed in the action research are illustrated in Table 8.2 and Table 8.3

Table 8.2 Confirmed KIP Performances and Practices

KAIZEN INITATIVE PROGRAM	
PERFORMANCE	**CONFIRMED FROM THE FIELD**
Local level effects due to the kaizen initiatives realized	**Social outcomes:** • strong commitment of teams to solve problems in their processes; • problem-solving attitude enhanced; • morale increased and generated willingness to go further; • team working attitude encouraged and improved.
Measurable CI actions: - *No. participants* *No processes selected for improvement*	No participants (education): 195 No participants (training): 127 No participants (kaizen): 102 No selected processes for kaizen: 8
Measurable performance effects limited to the KIs boundaries: *technical outcomes*	Technical outcomes as: • technical benefits as waiting time reduction, patient steps reduction; saturation medical exams booking to respond to patients' demand (completed kaizen initiatives) • data analysis benefits: awareness on how complex processes are working due to numbers and data analysis.

Little or no bottom line impacts, *as profit, social and environmental objectives (Osland and Zhou, 2013)*	No bottom line effects at this level of implementation. It is the first launch of policy deployment.
Inception of policy deployment	• Engagement of top managers • Empowerment of professionals • Alignment between strategy and selected kaizen initiatives • Formal protocol to execute improvement

Source: Adapted from Bessant and Francis (1999)

Table 8.3 Confirmed KIP Practices

KAIZEN INITATIVE PROGRAM	
PRACTICE	**CONFIRMED FROM THE FIELD**
Formal endeavour to incept and maintain CI	• Formal project of policy deployment for continuous improvement in the healthcare system; • Establishment of a Steering Committee as a board office; • Design and Support to hospitals; • Education to top managers • Training to operative healthcare professionals
Use of a declared and official problem-solving process	• Adherence to lean principles; • Formal problem-solving process transferred and used: PDCA Cycle
Participative approach Participation enhancement	Active involvement of professionals in the: • Decision-making process for selecting topic areas and kaizen initiatives • Kaizen implementation (team autonomy)
Structured training in basic CI tools:	Training followed a formal educational programme consisting in transferring the following basic tools for improvement: A3*; VSM; Root causes analysis; Ishikawa Diagram; 5S; Spaghetti chart.*
Structured management system	• Structured management system with sequential processes to launch and supervise the policy deployment for continuous improvement in the territorial healthcare system including its hospitals: (Design and support, Education, Training and Kaizen.
Recognition system	Leader and kaizen teams recognised officially by: • The board office; • Their general directors and the top managers. Leaders were identified due to selection criteria

Parallel system to processes	• Kaizen initiatives worked parallelly with the daily operations
Cross-functional work for ad hoc kaizen action	• Team membership was heterogeneous: professionals involved represented the functions covered by the process object of the analysis

Source: Adapted from Bessant and Francis (1999)

The proposition 4 is divided in three main sub-propositions based on the performances and practices provided:

PROPOSITION 4a: to guarantee the KIP success, managers should first align kaizen initiatives with the hospital strategy and secondly activate them.

PROPOSITION 4b: Kaizen teams should be legitimated through a recognition system within the hospitals. Such recognition will facilitate and safeguard kaizen teams' efforts against potential cultural barriers.

PROPOSITION 4c: The role of leaders played by department directors or coordinators could encourage teams to persist during the first experience of kaizen.

in seven out of eight teams, directors and coordinators as powerful leaders stimulated and pushed professionals to persist and go further.

PROPOSITION 4d: Kaizen teams should be legitimated through a recognition system within the hospitals. Such recognition will facilitate and safeguard kaizen teams' efforts against potential cultural barriers;

During the project a kaizen protocol was provided for guiding teams to the PDCA cycle. It was helpful for their first approach to problem-solving. All professionals appreciated this modality, but the expected deadline for achieving the kaizen targets were not observed because the kaizen progress depended on the process complexity and on the team size.

The protocol provided and revised during the action project is presented in Table 8.4 as suggestion from the field.

Table 8.4 Kaizen Protocol revised

Protocol Item	Suggestion
Time Schedule	**Define a starting date for the kaizen implementation** **Indicate an expected time range for the kaizen fulfilment but not a precise deadline because kaizen initiatives differ each other's**
Kaizen steps following the PDCA cycle	**Step 1: Kaizen initiative setting and A3-Report preparation** - Perimeter and problem identification; use of tools for the analysis. **Step 2**: **Objective, Countermeasures and plan definition** - Identification of the objective; - Definition of the countermeasures; - Design of the implementation plan with tasks, internal deadlines and responsibilities **Step 3: Plan implementation** **Step 4: Monitoring and results collection for the evaluation (adjustment or standardisation)**

Summarizing, KIP modalities identified from the literature and confirmed by this study are:

1. a strict adherence to lean principles;

2. a structured mechanism for continuous improvement activated and maintained;

3. strategic management with a clear focus on continuous improvement mechanisms;

4. a precise alignment of kaizen initiatives with the organisational strategy;

5. targets identified and clearly communicated;

6. a participative approach spread.

On the other side, the KIP modality not already confirmed is the reliable monitoring system because only the progress status and the adherence to the policy deployment project were monitored. It was too early to apply a monitoring system to measure the evolution of key performance indicators.

Propositions 4 and its sub-propositions (4a, 4b, 4c, 4d) provide s structured continuous improvement policy deployment in public hospitals, but it concerns only the first year of implementation: Thus, such propositions provide:

- a partial response to the second part of the second research question about guaranteeing **a structured continuous improvement in healthcare;**

- **fulfil partially the gap n. 6** (Lack of knowledge on how a Kaizen Program should be deployed in healthcare)

Architectural propositions and procedural propositions contribute to fulfil the relevant gap n. 3: Little focus on long-term perspective for organizing continuous improvement in healthcare at strategy level.

Proposition on social outcomes for future research

PROPOSITION 5: It will be useful to investigate the social outcomes and their determinants in a context of a declared policy deployment in hospitals through a survey.
PROPOSITION 6: It will be useful to investigate the commitment to change in a context of a declared policy deployment in hospitals through a survey.

Team leaders and members of the Regional Steering Committee were interviewed respectively through a de-structured modality and a semi-structured modality.
A strong enthusiasm to go further with the kaizen approach and the structured policy deployment was declared.
The following social benefits were identified:

- strong commitment of teams to solve problems in their processes;
- problem-solving attitude enhanced;
- morale increased and generated willingness to go further;
- team working attitude encouraged and improved.

These benefits could be summarized as Bortolotti et al. (2018): the problem-solving capabilities of employees and their attitude as the level of enthusiasm, the level of desire and the comfort to work in a team.
Moreover, in the cross-case analysis, team size and heterogeneity, leadership, team autonomy and goal clarity were described.
Through the direct experience, the observation of the dynamics and the preliminary results of the interviews, it seems that team autonomy and goal clarity influenced the attitude of professionals involved, as proved by Bortolotti et al. (2018). In fact, the goal

clarity provided a common purpose to be achieved by the whole team. Moreover, the leadership significantly influenced the team behaviour towards the achievement of the common goal.

Proposition Summary

Propositions are classified as:

- Propositions confirming the literature;
- Propositions modifying partially the literature;
- Brand new propositions;
- Propositions for the future.

Propositions confirming the literature

PROPOSITION 2: Policy deployment should be considered as a process to be managed to successfully launch and sustain continuous improvement.

This proposition confirms Witcher and Butterworth (2001).

Propositions modifying partially the literature

Propositions from 1A to 1C move from the manufacturing and industry literature (Van Aken et al., 2010 and Glover et. al, 2013) to the healthcare literature:

- A Kaizen Program is adapted for the healthcare context;
- A Kaizen Initiative Program is applied in a context facing its first kaizen experience, differently from Van Aken et al., 2010 and Glover et. al, 2013.

PROPOSITION 1A: a successful policy deployment for continuous improvement in public hospitals could be launched through a Kaizen Initiative Program.

PROPOSITION 1B: A successful Kaizen Initiative Program should consider the following processes as key drivers (what): Design and Support, Education, Training and Kaizen.

PROPOSITION 1C: the successful launch of a Kaizen Initiative Program should respect a time sequence for acting the key drivers (when): 1) Design and Support; 2) Education; 3) Training; 4) Kaizen.

Propositions from 4 to 4c confirm the performance and the practice items from Bessant and Francis (1999) regarding the Level 2 for a Continuous Improvement Evolution.

But propositions demonstrate that the learning process could start from the level 2 (structured and systematic CI) of Bessant and Francis's scale (1999) due to the deployment of a KIP. Thus, level 0 and Level 1 could be skipped.

PROPOSITION 4: The Kaizen Initiative Program represents a structured and systemic level of continuous improvement in a public healthcare system.

PROPOSITION 4a: to guarantee the KIP success, managers should first align kaizen initiatives with the hospital strategy and secondly activate them.

PROPOSITION 4b: Kaizen teams should be legitimated through a recognition system within the hospitals. Such recognition will facilitate and safeguard kaizen teams' efforts against potential cultural barriers.

PROPOSITION 4c: The role of leaders played by department directors or coordinators could encourage teams to persist during the first experience of kaizen.

In seven out of eight teams, directors and coordinators as powerful leaders stimulated and pushed professionals to persist and go further.

PROPOSITION 4d: Kaizen teams should be legitimated through a recognition system within the hospitals. Such recognition will facilitate and safeguard kaizen teams' efforts against potential cultural barriers;

Brand new propositions

Propositions from 3A to 3B provide reliable insights on a successful launch of policy deployment for continuous improvement in public hospitals.

PROPOSITION 3A: In public healthcare, the very first policy deployment for continuous improvement has chance of success if launched by the authority to which the hospitals belong;

PROPOSITION 3B: Consequently, the establishment of a Territorial Kaizen Committee could sustain the policy deployment and guarantee the success of kaizen implementation.

PROPOSITION 3C: A successful launch of a kaizen policy deployment applies a participative approach.

Propositions for the future

Proposition 5 introduces to further research focusing on social outcomes in a more detailed manner and on the commitment to change (Herscovitch and Meyer, 2002).

PROPOSITION 5: It will be useful to investigate the social outcomes and their determinants in a context of a declared policy deployment in hospitals through a survey.

PROPOSITION 6: It will be useful to investigate the commitment to organisational change in a context of a declared policy deployment in hospitals through a survey.

CHAPTER 9

CONCLUSIONS

Based on healthcare literature review findings, it can be argued that most of the scholars describes successful kaizen initiatives and report their technical outcomes such as time and length of stay reduction (e.g. Laganga, 2011; Natale et al., 2014, Smith et al., 2012). On the other side, scholars agree that the current challenge of the healthcare system is to provide care quality and appropriateness through 1) the efficient and effective use of resources and 2) the observance of financial restrictions defined by governments. In accordance with such challenge, the policy deployment in healthcare is recognised as a critical issue to sustain continuous improvement, but only the recent literature is trying to provide a response.

This thesis aimed at filling this gap by developing and testing a theoretical framework to understand how the continuous improvement approach could be adopted and adapted to a public hospital and what features should be considered as key drivers of a successful implementation. It was meant to investigate the linkage between decisions at the strategic level and those regarding the implementation of kaizen initiatives over time.

First, two key definitions from the literature were considered as guidance for the theoretical framework:

- *Kaizen Initiative* as *a structured project performed by a heterogeneous team for improving a specific process in a defined time schedu*le (Bortolotti et al. 2018);
- *Kaizen Event Program as a systematically use of kaizen to introduce rapid change in targeted working areas, based on lean principles* (Van Aken et al., 2010).

Secondly, a definition of kaizen program in healthcare were defined:

- a *Kaizen Initiative Program* (hereinafter KIP) is a structured policy framework applied for systematically implement kaizen initiatives and thus to introduce a permanent change in selected processes, complying with lean principles and aligning operation goals with the organisational policy.

Finally, based on the literature findings, its characteristics were delineated:

- a strict adherence to lean principles;

- a structured mechanism for continuous improvement to be activated and maintained;
- strategic management with a clear focus on continuous improvement mechanisms;
- a precise alignment of kaizen initiatives with the organisational strategy (policy deployment);
- targets to be identified and clearly communicated;
- a reliable monitoring system to be performed;
- a participative approach to be spread.

The Kaizen Initiative Program was tested due to the launch and implementation of a policy deployment for continuous improvement in an Italian regional healthcare system made up of seven public hospitals. The action research methodology was adopted to investigate the organizational change. A regional board was established to launch and managed the policy deployment, n. 7 hospitals involved, n. 195 top managers educated, n. 127 professionals trained, n. 8 kaizen initiatives activated (1 per each hospital at least), n. 102 professionals involved in kaizen teams, n. 6 formal meetings organized; 68 hours dedicated for training, 400 hours dedicated in the project by action researchers. Based on the results and the proposition discussed, the theoretical contribution and the managerial implications are presented below.

Theoretical contribution

This research contributes to the body of knowledge providing a tested framework to successfully launch and implement a policy deployment for continuous improvement in public hospitals. The tested framework is named Kaizen Initiative Program and it allows to select kaizen initiatives linked to the organisational strategy. It was tested in a territorial healthcare system to which belonged seven public hospitals. Thus, the framework is a versatile tool that could be applied in different healthcare contexts.

The architecture of the Kaizen Initiative Program is illustrated in Figure 9.1

Figure 9.1 Kaizen Initiative Program Architecture

Process	Sub-processes	Tasks of sub-processes
1 **Design and Support**	*Planning*	Establishment of the Umbrella Steering Committee (USC) Overall objective identification Strategic definition of the main features of the Kaizen Initiatives Identification of the method to be used. Scheduling
	Coordination	Project and objectives dissemination Recognition of the established kaizen teams Kaizen Initiatives Selection and Coordination Monitoring and Evaluation Exchange of experience among teams
	Dissemination of results	
2 **Education**	*Communication of the long-term strategy* (one-year kaizen)	
	Orienting to kaizen methodology	
	Selection of potential team leaders	
3 **Training**	*Methodology and Tools Training*	Transferring basic lean tools
	Transferring Knowledge Training	Training for practicing
4 **Kaizen**	*Preparation*	Identification of the specific work team Identification of the initiative boundaries Communication of implementation rules
	Execution	Kick off Meeting Training Team A3 tool methodology Application Check of improvements Measuring and adjusting Standardizing new working behaviours

This framework focuses on the linkage between strategy and operations. Moreover, the success of policy deployment for continuous improvement is ensured by respecting the proper sequence of processes (when). The main processes to be considered are: Design and Support as the umbrella process for the launch and support of the kaizen initiative program; Education, Training and Kaizen as the operative processes to deploy the strategy.

Moreover, it is confirmed that policy deployment needs to be considered as a process, according to Witcher and Butterworth (2001).

For this reason, tested successful modalities to deploy continuous improvement in a healthcare system are provided:

1. the engagement of both the territorial authority and the top managers to launch successfully the policy deployment for continuous improvement in public hospitals;

2. The participative approach involving all the hierarchical levels: top management, middle management and operative healthcare professionals;

3. The formal recognition system of facilitators, leaders and team members;

4. The active participation of top and middle managers in the kaizen initiatives.

Moreover, performances and practices tested from Bessant and Francis (1999) confirm that a Kaizen Initiative Program could be defined as a Structured and Systematic Continuous Improvement Learning Process, according to the authors. Moreover, the framework allows to start a structured kaizen experience from the first endeavours, avoiding intermittent or casual kaizen initiatives (Table 9.1 and Table 9.2).

Table 9.1 Performances confirmed

KAIZEN INITATIVE PROGRAM	
PERFORMANCE	**CONFIRMED FROM THE FIELD**
Local level effects due to the kaizen initiatives realized	**Social outcomes:** • strong commitment of teams to solve problems in their processes; • problem-solving attitude enhanced; • morale increased and generated willingness to go further; • team working attitude encouraged and improved.
Measurable CI actions: - *No. participants* *No processes selected for improvement*	No participants (education): 195 No participants (training): 127 No participants (kaizen): 102 No selected processes for kaizen: 8
Measurable performance effects limited to the KIs boundaries: *technical outcomes*	Technical outcomes as: • technical benefits as waiting time reduction, patient steps reduction; saturation medical exams booking to respond to patients' demand (completed kaizen initiatives) • data analysis benefits: awareness on how complex processes are working due to numbers and data analysis.
Little or no bottom line impacts, *as profit, social and environmental objectives (Osland and Zhou, 2013)*	No bottom line effects at this level of implementation. It is the first launch of policy deployment.

Inception of policy deployment	• Engagement of top managers • Empowerment of professionals • Alignment between strategy and selected kaizen initiatives • Formal protocol to execute improvement

Table 9.2 Performances confirmed

KAIZEN INITATIVE PROGRAM	
PRACTICE	**CONFIRMED FROM THE FIELD**
Formal endeavour to incept and maintain CI	• Formal project of policy deployment for continuous improvement in the healthcare system; • Establishment of a Steering Committee as a board office; • Design and Support to hospitals; • Education to top managers • Training to operative healthcare professionals
Use of a declared and official problem-solving process	• Adherence to lean principles; • Formal problem-solving process transferred and used: PDCA Cycle
Participative approach Participation enhancement	Active involvement of professionals in the: • Decision-making process for selecting topic areas and kaizen initiatives • Kaizen implementation (team autonomy)
Structured training in basic CI tools:	• Training followed a formal educational programme consisting in transferring the following basic tools for improvement: A3; VSM; Root causes analysis; Ishikawa Diagram; 5S; Spaghetti chart.
Structured management system	• Structured management system with sequential processes to launch and supervise the policy deployment for continuous improvement in the territorial healthcare system including its hospitals: (Design and support, Education, Training and Kaizen.
Recognition system	Leader and kaizen teams recognised officially by: • The board office; • Their general directors and the top managers. Leaders were identified due to selection criteria
Parallel system to processes	• Kaizen initiatives worked parallelly with the daily operations
Cross-functional work for ad hoc kaizen action	• Team membership was heterogeneous: professionals involved represented the functions covered by the process object of the analysis

Managerial implications

In terms of managerial implications, this study provides to healthcare managers a structured tool to successfully design and deploy the continuous improvement, linking strategy objectives to the operational targets and *vice versa* from the first experience. Such tool, that is the Kaizen Initiative Program avoids the use of bottom-up and pop-corn initiatives.

The cohesive approach used to align strategy with daily operations in hospitals implicates the participation of any hierarchical level within the organisation, from the top managers to healthcare professionals, including both clinical a non-clinical role.

This approach is structured but flexible. Structured to guarantee the success of launch and implementation of continuous improvement thorough a logical sequence of processes: design and support, education, training and implementation. Flexible for considering the peculiarities of each hospital, for selecting processes to be analysed and for guaranteeing leaders' and team autonomy.

Thus, the approach provides practices that could support the efforts to firstly activate kaizen initiatives and secondly trigger a cultural change within their organisation. Such practices that could be introduced at both system level (e.g. territorial or district healthcare authorities) and hospital level are suggested below:

- To manage policy deployment as a process to be designed, structured and supported;
- To establishing a task force (Steering Committee) at system or hospital level to enhance the continuous improvement over time;
- To identify the basic knowledge and the basic tools to be transferred (skills and tool equipment for kaizen) and then create a training programme protocol;
- To define the learning process to be designed and launched (Education, Training and Kaizen implementation);
- To choose how to share the information;
- To manage kaizen initiatives through a set of guidelines, recommendations and rules about the implementation;
- To consider the kaizen implementation as a process divided into two main phases: preparation and execution.

These practices emerged from the study experience could be transferred in any healthcare context.

Research limitations and future research

It is important to describe the limitations of the research to further define potential future research:

- Firstly, the study investigated a Kaizen Initiative Program in an Italian healthcare context approaching the kaizen methodology for the first time. For this reason, the framework is tested only to launch and implement the policy deployment for continuous improvement. In fact, the researcher cannot completely affirm if the framework is useful to successfully sustain continuous improvement over time. It is needed to continue the study for at least another year.
- Secondly, the application of the Kaizen Initiative Program was not compared with healthcare contexts in which the continuous improvement is already sustained. It could be interesting to compare this research with such existing kaizen experiences that are deploying continuous improvement without declaring a policy framework.
- Thirdly, kaizen initiatives are worthy to be compared to investigate social outcomes and their determinants in a more deepen way, according to Bortolotti et l. (2018). This study gathered data only from de-structured or semi-structured interviews addressed to seven top managers and eight team leaders.

Fourthly, the commitment to organisational change was not investigated at system, hospital and kaizen initiative level. It will be interesting to analyse these issues, according to Herscovithc and Meyer (2002). Thes authors defined commitment to organisational change as a mindset that binds and individual to a course of action deemed necessary for the successful implementation of a change initiative. This mindset can reflect: (a) a desire to provide support for the change based on a belief in its inherent benefits (affective commitment to change); (b) a recognition that there are costs associated with failure to provide support for the change (continuance commitment to change) and (c) a sense of obligation to provide support for the change (normative commitment to change).

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