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Managing healthcare quality using logical framework analysis

Managing
healthcare
quality

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Abstract

Purpose – The purpose of this paper is to develop an integrated quality management model that identifies problems, suggests solutions, develops a framework for implementation and helps to evaluate dynamically healthcare service performance.

Design/methodology/approach – This study used the logical framework analysis (LFA) to improve the performance of healthcare service processes. LFA has three major steps – problems identification, solution derivation, and formation of a planning matrix for implementation. LFA has been applied in a case-study environment to three acute healthcare services (Operating Room utilisation, Accident and Emergency, and Intensive Care) in order to demonstrate its effectiveness.

Findings – The paper finds that LFA is an effective method of quality management of hospital-based healthcare services.

Research limitations/implications – This study shows LFA application in three service processes in one hospital. This very limited population sample needs to be extended.

Practical implications – The proposed model can be implemented in hospital-based healthcare services in order to improve performance. It may also be applied to other services.

Originality/value – Quality improvement in healthcare services is a complex and multi-dimensional task. Although various quality management tools are routinely deployed for identifying quality issues in healthcare delivery, they are not without flaws. There is an absence of an integrated approach, which can identify and analyse issues, provide solutions to resolve those issues, develop a project management framework to implement those solutions. This study introduces an integrated and uniform quality management tool for healthcare services.

Keywords Health services, Hospitals, Quality management

Paper type Research paper

I. Introduction

Healthcare is the fastest growing service in both developed and developing countries. With the explosive development of knowledge, technology and globalisation there is now an increasing requirement of high-technology medical care. Every country is striving hard to cope with this increasing need of healthcare facilities in terms of both human and material resources (Feeney and Zairi, 1996). However, it is important that these facilities are available; they perform to the required standards so as to satisfy



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both healthcare personnel and patients. Like any other industry, operations in healthcare industry is considered as a series of processes, and superior performance of these processes is essential in order to remain competitive. The continuous quality improvement (CQI) concept has been applied in healthcare by many researchers in the Emergency Department (Re and Krousel-Wood, 1991; Fernandes and Christenson, 1995; Fernandes and Christenson, 1996). Data-Attitude-Tools (D*A*T), Deming's PDCA cycle, and Utilisation Review and Management have been suggested for quality improvement in healthcare services by researchers (Van Matre, 1992; Berwick, 1998). However, many of these are general guidelines and do not specifically address the unique problems of specific services in the hospital-based healthcare system. Moreover, planning and implementing the improvement projects is the most challenging task, which was not discussed by any of the above studies. In the hospital-based healthcare practices, there are uniform and global approaches towards identifying deficiencies of specific service and planning strategies to mitigate those deficiencies in order to achieve superior performance (Lurie *et al.*, 2002). Most healthcare units use a peer-review process to identify issues and concerns of improved performance (Snelson, 1992). The Joint Commission on Accrediting Health Care Organizations proposed a "10-step monitoring and evaluation process" for improving quality of healthcare services. Although this identifies problems and concerns of specific unit, it does not provide a framework of strategies for corrections and improvement. Chen *et al.* (2004) reported issues of implementing total quality management projects in the healthcare service in Taiwan.

Quality in healthcare is usually assessed by three parameters, namely, structure, process and outcome of healthcare services (Donabedian, 1988). Quality improvement measures should preferably include all the three parameters. Consideration of all three parameters is often absent in the current practices. The structure of the hospitals is assessed by the human and material resources available in each hospital (*US News & World Report*, 1990). Processes in hospitals have been difficult to measure by specific metrics (Green *et al.*, 1997). Measurement may require large databases, which may not be consistently available (Palmer, 1997). A process-based approach for measuring hospital performance and the Intensive Care Unit (ICU) was presented by Harharan *et al.* (2004) and Dey *et al.* (2004) respectively.

Currently, outcome-based models dominate the arena of performance measurement in the majority of healthcare institutions. Outcomes are usually evaluated by the risk-adjusted mortality rate of each hospital (Green *et al.*, 1997). This is done by applying prognostic scoring systems in units such as the Operating Room (OR), ICU and Accident and Emergency. Many such models exist such as the Physiologic and Operative Scoring System for Enumeration of Morbidity and Mortality (POSSUM) for operative morbidity and mortality (OR); Acute Physiology and Chronic Health Evaluation (APACHE) for ICU morbidity and mortality and the Trauma Injury Severity Scoring System (TRISS) for trauma patients in Accident and Emergency (Copeland *et al.*, 1991; Knaus *et al.*, 1991; Wong *et al.*, 1996). These systems offer logistic regression equations for calculating the predicted outcome for a particular case-mix of patients (Marik and Varon, 1999). The ratio of the observed outcome to the predicted outcome indirectly indicates the performance of the unit (Glance *et al.*, 2002). These outcome-based models exclusively consider in a binary fashion either "death" or "survival" of the patient as a quality indicator. These may not be useful by themselves

as an overall indicator of performance (Popovich, 2002), due to situations where, despite adequate medical care, patients may have an adverse outcome due to factors not under the control of the physicians (Brook and McGlynn, 1996). Hence patient-outcome should only be one aspect of quality measurement rather than overall performance measurement.

In view of the above, there is a need of a uniform model, which provides all the aspects (structure, processes and outcomes) of quality improvement from concept to implementation in order to perform better. Organisations require fostering a quality culture, which would identify issues/problems in the system dynamically, suggest solutions to those issues and develop a framework for implementation of those solutions. Moreover, relating improvement measures of each service with the strategies of the entire organisation is another challenge to healthcare services providers. Accordingly, the objective of this study is to develop an integrated quality management model for hospital-based healthcare services.

The remainder of the paper has been organised in the following ways. Section II describes methodology, Section III depicts logical framework analysis (LFA) and its utilities in resolving various management issues, Section IV develops quality management models using LFA, Section V demonstrates the effectiveness of the model using a case study and Section VI concludes the study by elaborating the advantages and disadvantages of the proposed model.

II. Methodology

This study used LFA to develop an integrated quality management model. It involved the concerned stakeholders to carry out each step of the model in order to identify improvement measures, plan improvement projects and implement them. This study adopts a case study method to demonstrate the effectiveness of the model.

III. The LFA

The LFA is an effective strategic planning and project management methodology with wide applications (Akroyd, 1999, 1995a, b; Argeetey, 1998; Cordingley, 1995). It comprises an integrated package of tools for analysing and solving planning problems, and for designing and managing their solutions within a stakeholder participatory framework. LFA was developed in the USA and has since been adopted and adapted for use by many other donors, including the Department for International Development (DFID) in the UK (DFID, 1997, 2005). A logical framework summarises, in standard format (Table I) what the project is going to achieve, what activities will be carried out to achieve its outputs and purpose, what resources are required, what are the potential problems which could affect the success of the project, and how the progress and ultimate success of the project will be measured and verified.

The method is robust and more disciplined than traditional expert-driven planning tools. Its effectiveness is enhanced by early and intimate involvement of stakeholders in the design phase, systematic logical analysis of problems, and application of a matrix in which development goals, activities, impact indicators and risk are all logically related in a succinct organisational framework (Smith, 2000).

This method is now widely used in a number of countries, as well as by the main international and bilateral aid agencies, for formulating strategies, designing regional and community development programs and investment projects (Bornstein, 2003).

Narrative summary	Key performance indicators	Means of verification	Assumptions/risks
<i>Goal</i> The overall development program or strategy goal	Indicators (standardised) that measure achievement of the desired goal	<i>Ex post</i> evaluation of the project	Key factors in the wider operating environment usually macro and extraneous factors to the project
<i>Purpose</i> Statement of the project's outcome – its immediate impact	Measures of enhanced development status when benefits are realised, quantified and time-bound	Base line and <i>ex post</i> surveys, direct observation or secondary data, reports	Usually non-project support factors required to ensure contribution to goal
<i>Output</i> Specific non-quantified results from managed activities – the deliverables	Results of managed applications of inputs, quantified in magnitude and time – project management indicators	Direct observation of key process and implementation progress indicators	Condition for success, usually within control of project management, required to achieve purpose
<i>Activities</i> Components to generate the outputs	Quantified factors of production required to produce the output via activities	Project documents	Pre-project status and inputs availability

Table I.
Structure of Logical
Framework matrix

However, according to the authors' knowledge this study is the first application of LFA for improving services quality in general and healthcare in specific.

Why logical framework?

Logical framework is an analytical management tool, which helps managers to:

- analyse the existing situation during project preparation;
- establish a logical hierarchy of means by which objectives will be reached;
- identify the potential risks to achieve the objectives and to sustain the outcomes;
- establish how outputs and outcomes might best be monitored and evaluated;
- present a summary of the project in a standard format;
- monitor and review projects during implementation;
- communicate project information;
- make decisions across various phases of project; and
- evaluate project after completion.

The approach involves problem analysis, stakeholder analysis, developing a hierarchy of objectives and selecting a preferred implementation strategy. The product of this analytical approach is the matrix (the Logframe), which summarises the intentions and *modus operandi* of the project, its key assumptions and the methods of monitoring and evaluating outputs and outcomes.

In the early 1970s, LFA was first formally adopted by the USAID as a planning tool for overseas development activities. LFA has since been successfully applied as a planning and management tool by a variety of agencies. Despite some criticisms, LFA

has become widely accepted and its use continues to expand into new areas. This is because it not only helps to provide a standardised summary and the logic of a project, but also applicable to various functions of any organisation (Smith, 2000). The present study adds another new dimension to its application. Logical framework has been applied in many healthcare projects in the public health arena, which includes implementation of national level tuberculosis project, HIV/AIDS project, malaria project, etc. (Task Force on the Communicable Disease Control in the Baltic Sea Region, 2004, Australian Government, 2004, Udenrigsministeriet, 2004; Department of Health (South Africa), 2004).

Main features of the LFA

LFA's main strength lies in its diagnostic capability. It provides a sound basis for identifying problems and for generating appropriate solutions and interventions to achieve specific objectives and goals. It has three basic steps:

- (1) brainstorming for problem analysis and deriving solutions;
- (2) formulating a logical framework from above objective analysis; and
- (3) systematic monitoring and evaluating using key success indicators before, during and after implementation.

IV. Quality management model using LFA

The proposed quality management model has the following steps:

- (1) *Identify a specific process for improvement.* Although to improve performance of a productive system, every process performance is required to be studied and improvement measures are to be derived, a specific process may be prioritised for improvement action.
- (2) *Identify performance parameters.* The process parameters are both objective and subjective in nature. Identifying those factors and developing a framework to analyse them are to be carried out to derive process performance.
- (3) *Measure current performance.* Extensive data collection and analysis in line with the performance measurement framework with the active involvement of the process owners are to be carried out in order to measure performance of each process.
- (4) *Identify issues related to the process not performing as desired using problem tree.* The reasons for non-achievement of desired performance level are to be identified using brainstorming among the process owners. First, the macro level problem is identified and subsequently, the root causes of that problem are identified hierarchically.
- (5) *Derive solutions to the above problems using objective tree.* Subsequently, an objective tree is developed, which corresponds to the problem tree of a specific process with the involvement of the process owners.
- (6) *Develop a logical framework using the information from the objective tree.* A logical framework is then formulated from the information in the objective trees. The logical framework matrix justifies the improvement project as well as providing an overview of the project plan.

- (7) *Develop a detailed project plan for implementation for improving process performance.* Information from logical framework along with other studies (survey, design and detailed engineering) helps develop detailed project plan.
- (8) *Obtain approval of the competent authority.* Approval from competent authority on the basis of project plan ensures of resource deployment and management commitment for performance improvement. While approving the management ensures link between process improvement projects and organisational strategies both in short and long terms.
- (9) *Implement, monitor, and evaluate the improvement projects.* Projects are then implemented with the involvement of specialised groups (from the matrix organisation structure) along with consultants, contractors, and suppliers (in line with the requirements), which ensures employee involvement in improving process performance.
- (10) *Measure the performance of the process using the earlier parameters and analyse for continuous improvement.* Process performance is dynamically monitored for the purpose of continuous improvement.

Figure 1 depicts the proposed quality management model using logical framework.

V. Application of the model in healthcare services

The effectiveness of the model has been demonstrated through applications in the healthcare services of a multi-disciplinary tertiary care hospital in Barbados.

Barbados is an island of the eastern Caribbean, with a population of 268,000. It is an English-speaking country of the British Commonwealth with a high quality-of-life index. The Queen Elizabeth Hospital is a 650-bed tertiary care centre, affiliated to the

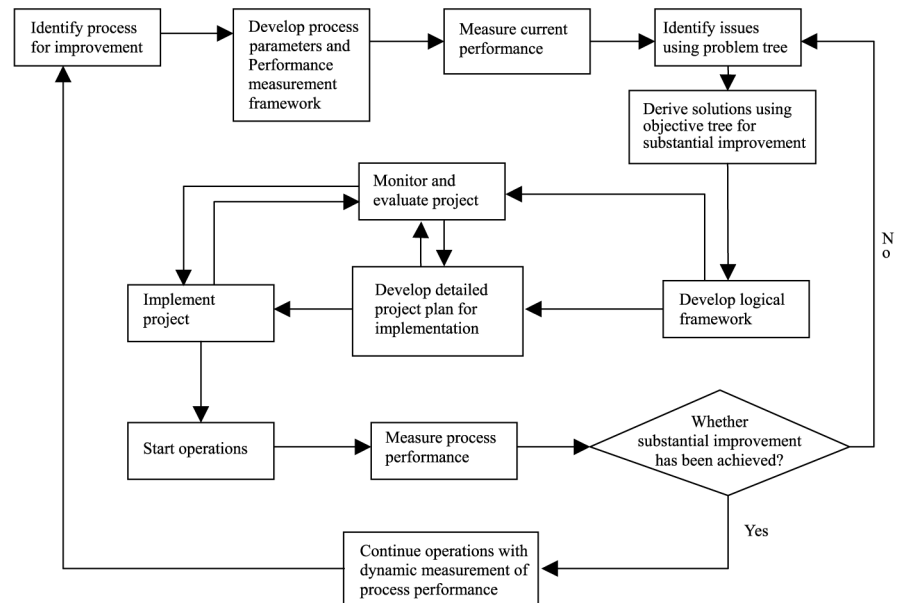


Figure 1.
Quality management model for improving process performance

University of West Indies and a referral centre for several Caribbean countries. The surgical ICU in the Queen Elizabeth Hospital Barbados, is a six-bed unit, admitting patients from all surgical specialties.

The analysis was undertaken with involvement of two hospital managers, five doctors, three nurses and two support staff in workshop environment using several structured brainstorming sessions. All the stakeholders involved in the case study had more than 15 years of experience in their respective fields. The researchers worked as the facilitators of the brain storming sessions.

The LFA approach to developing a quality management model was undertaken using the following ten steps.

Step 1

After detailed discussion with the hospital management on quality improvement, the researchers decided to study healthcare services in the three following critical care units:

- (1) ORs;
- (2) ICU; and
- (3) Accident and Emergency unit.

They were selected on the basis of importance and their inferior performance with respect to overall hospital performance (Harharan *et al.*, 2004).

Step 2

In healthcare services, process performance can be measured by throughput (number of patients being treated in a given period), patient comfort (patient-focused care) and outcome (quality of treatment) (Harharan *et al.*, 2004, 2005). In this study a thorough brainstorming session among the clinical professionals revealed the process parameters of the units under study. The process parameters for operation room utilisation were “surgery on time” and “minimal patient-adverse outcome”. “Patient throughput” and “minimal patient-adverse outcome” were the process parameters for accident and emergency services. The process parameters of ICU were “reduced morbidity and mortality” and “increased patient comfort”.

Step 3

The performance data analysis of all the above processes revealed that currently, all the three processes were not performing to the desired level. Recent audit revealed that in the OR, both the performance parameters were below target levels of customer (patients and clinician) satisfaction (Ramesh *et al.*, 2005). Delay in treating patients and increased adverse patient outcomes of were recognised as the problems in the Accident and Emergency unit (Banerjea, 2004). Increased morbidity and mortality (measured using standard mortality ratio) and decreased patient satisfaction were observed in the intensive care unit of the hospital under study (Hariharan *et al.* 2002).

Step 4

Each process was separately studied with the involvement of stakeholder representatives from all the clinical professionals (including medical, nursing and paramedical personnel). These practitioners were involved in brainstorming sessions. First, they

identified macro level issue for each process and subsequently derived root causes of macro issues. This helped to develop a hierarchy of issues (problem tree) for each process.

Figure 2 shows the problem tree of the OR utilisation process as derived by the stakeholders. The root-cause analysis revealed that lack of motivation of doctors, nurses and support staff, inappropriate scheduling and inefficient OR management were the basic reasons for not achieving desired performance. Figure 3 shows the problem tree of Accident and Emergency of the hospital under study. Delay in consultation, improper triaging, delay in patients disposal, and inadequate infrastructure were considered by the stakeholders as the major reasons for unsatisfactory performance of the accident and emergency services. The stakeholders identified the root causes of increased morbidity and mortality and decreased patient comfort in the ICU. They were as follows:

- problem related to doctors, nurses, and support staff;
- inadequate ICU drugs and equipment;
- improper maintenance of equipment and facilities;
- problem caused by other related units (laboratory, Accident and Emergency unit, Operation Room, etc.);
- absence of treatment protocol; and
- improper communication.

Figure 4 shows the problem tree of the ICU as developed by the stakeholders.

Step 5

Subsequent brainstorming sessions enabled the stakeholders to formulate the objective trees (hierarchy of the suggested solutions). Each level of the objective tree indicates solutions to corresponding level of the problem tree.

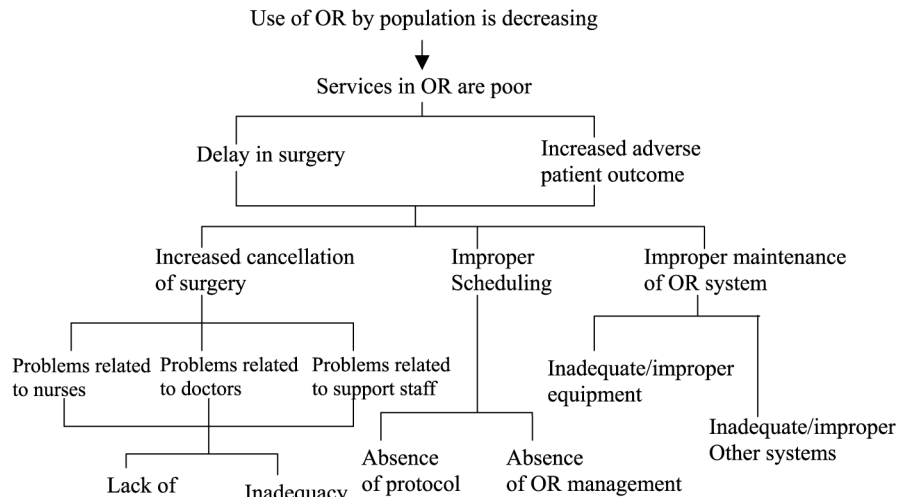


Figure 2.
Problem tree for the
Operating Rooms

OR = operating rooms

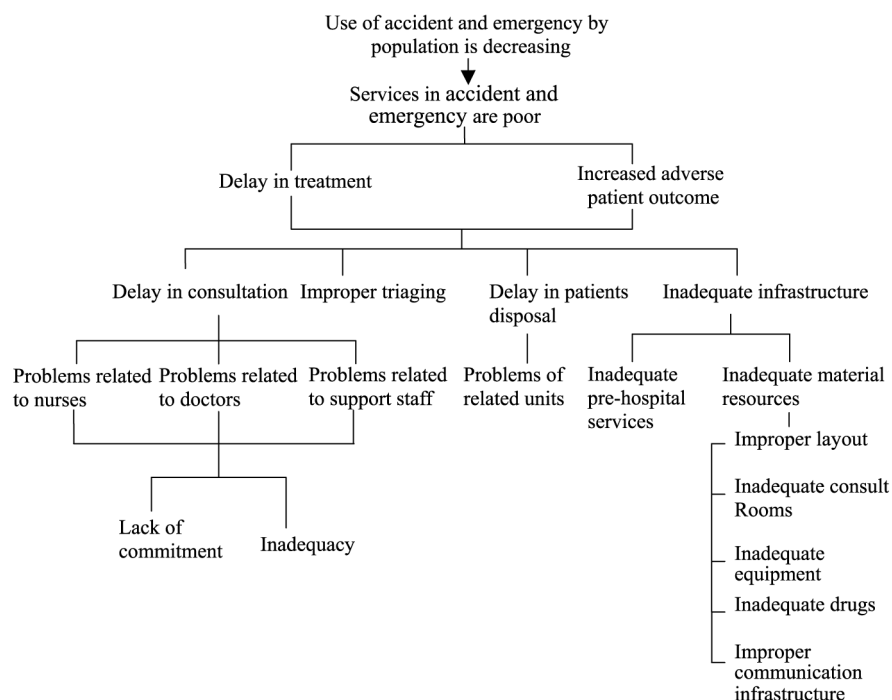


Figure 3. Problem tree for the Accident and Emergency unit

Figure 5 shows the objective tree of the OR utilisation process. The managers and clinicians derived that new recruitment policy, fair salaries, improved working conditions, promotion and reward system, team development activities, IT-based scheduling program, trained operation room management team, preventive maintenance program for all equipment and OR system, and purchasing of state-of-art equipment would improve the performance of the entire unit.

Figure 6 demonstrates the objective tree of the Accident and Emergency of the hospital under study. Additional recruitment, training, and team building activities were considered as the solutions to delay in consultation. They revealed that appropriate triaging, improvement of functioning of other related units like ICU, OR etc., efficient pre-hospital services like ambulance services, communication services and adequate infrastructure would make productive Accident and Emergency services.

Figure 7 shows the objective tree for the ICU as developed by the stakeholders in the brainstorming session. It revealed that motivated clinical professionals with adequate materials resources (drug and disposables) and facilities (infrastructure and equipment) using standardised treatment protocol could improve the ICU performance substantially.

Step 6

The next step involved the development of the logical framework from the objective tree. The top level of the objective tree formed the goal of the project, the next level comprised the project purpose, the last level in the hierarchy formed the

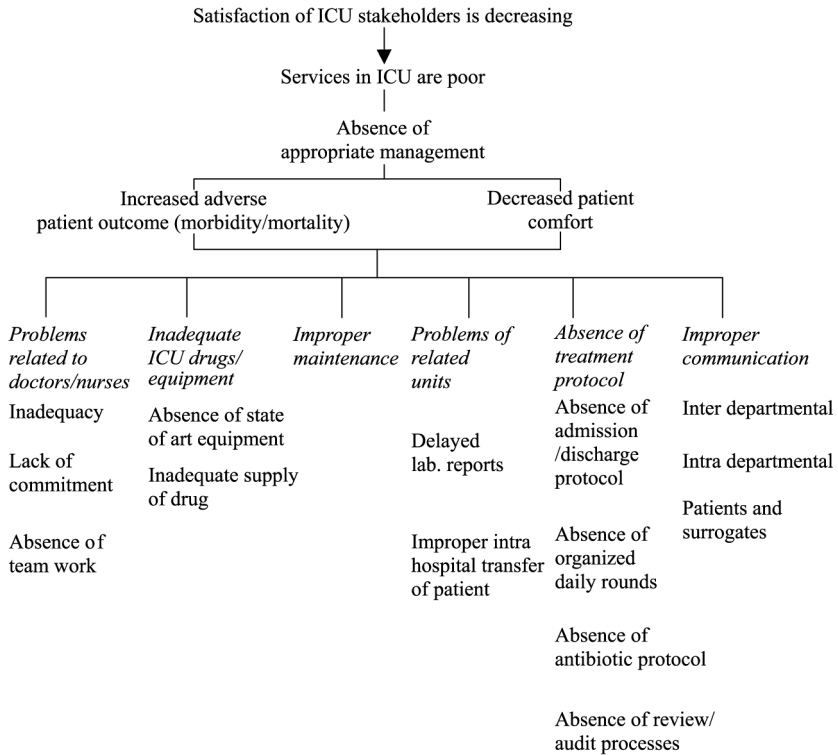


Figure 4.
Problem tree for the
Intensive Care Unit (ICU)

activities/inputs in the logical framework and the level above the last formed the project outputs. The other information for formulating logical framework was gathered from other planning processes with the stakeholders' involvement. The first column of the logical framework was the objectives covering goal, purpose, outputs and inputs for improvement project in each level. The second column depicted the objective indicators of goal, purpose, outputs and inputs. The third column was the means of verification of the indicators of each level. The last column represented the assumptions of each level.

Tables II-IV show the logical framework of the OR utilisation process, the Accident and Emergency services and ICU of hospital under study.

Step 7

Although the main purpose of developing logical framework was to present project information in nutshell in order to get approval from the competent authority, it formed the basis for the development of a detailed project plan (project specification, schedule, and budget). The stakeholders developed detailed project plans and budget for the three units under study using information in the logical framework analysis.

Step 8

A project plan along with the logical framework of each unit was put up to the hospital management for approval. The logical framework provided the rational of the

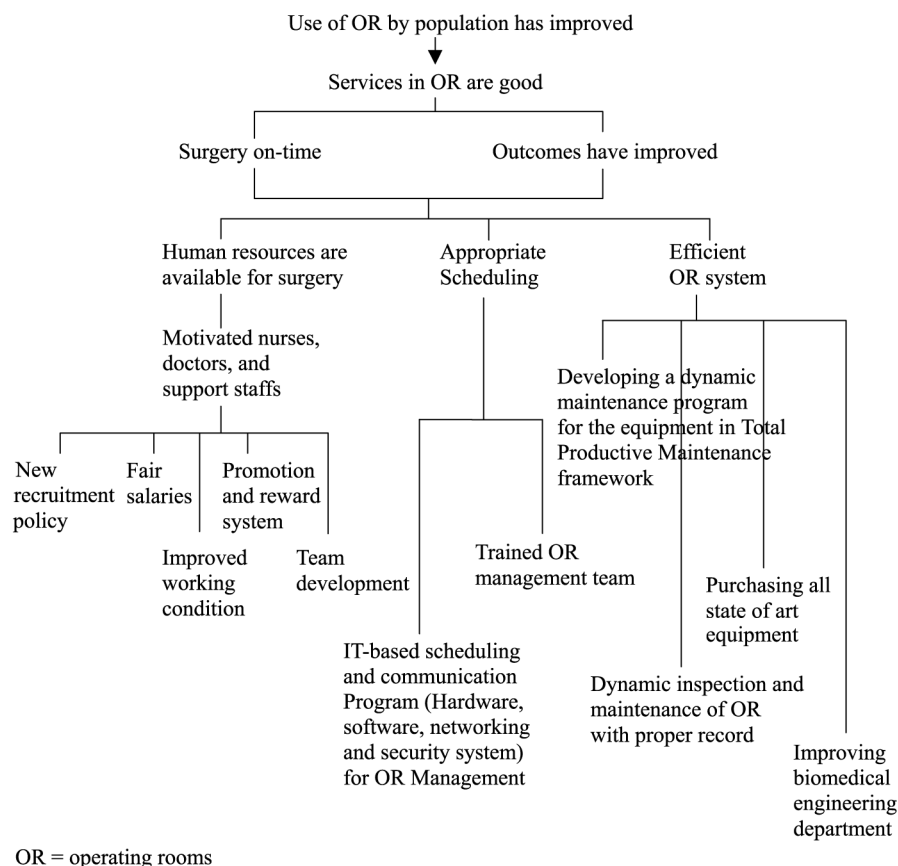


Figure 5.
Objective tree for the
Operating Rooms

improvement projects and also provided the means for project monitoring and evaluation. After a thorough analysis of the project plan and linking it with the strategic goals of the organisation, the hospital management approved the improvement projects with a few amendments in the plans.

Step 9

Detailed implementation plans were subsequently worked out for each unit. Improvement projects were then implemented with the active participation of various project participating agencies (contractors, suppliers, consultants etc.). The project was constantly monitored and evaluated using the parameters set forth in the logical framework.

Step 10

On completion of the improvement projects, they were linked with the existing services in each unit. Subsequent performance measurement revealed that there was

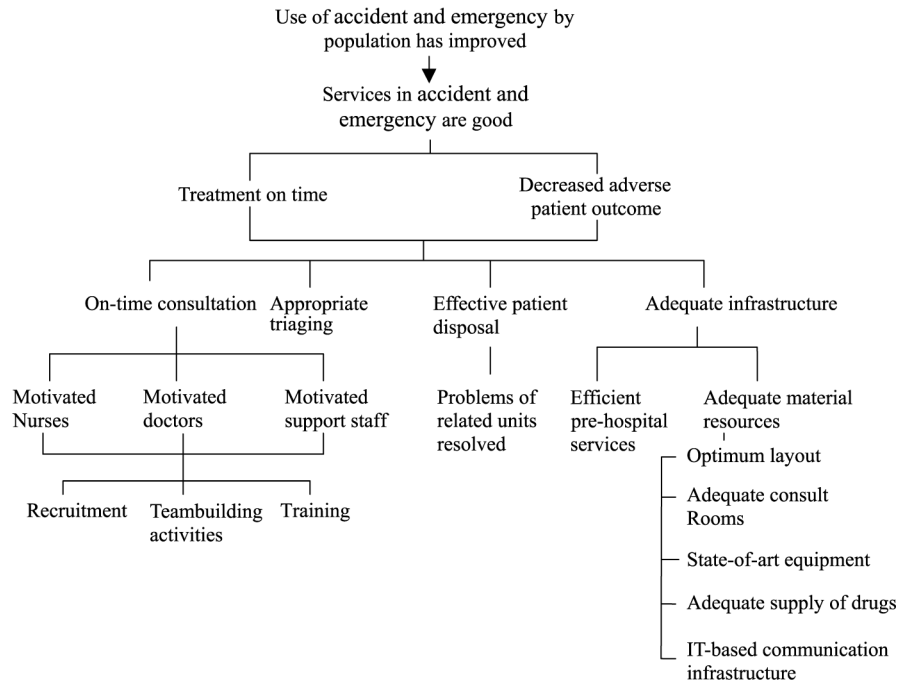


Figure 6.
Objective tree for the
Accident and Emergency

improvement in all the three units in terms of patients throughput, reduced adverse patient occurrence and patients' satisfaction.

In OR, on time surgery had improved by 40 per cent and there were no patient-adverse outcome subsequent to implementation of quality improvement projects. In the Accident and Emergency services also there was no report of patient-adverse outcome and the patient throughput was increased by 25 per cent subsequent to implementation of quality improvement projects. In the ICU, morbidity and mortality were considerably reduced (measured using the Standard Mortality Ratio) and patient satisfaction index was improved by 35 per cent.

VI. Discussion and conclusion

Quality management practices in healthcare services are characterised by their fragmented approach, absence of holistic and uniform framework and without any link to the strategic intent of the organisation as a whole. In order to improve service performance, the management should consider all the quality parameters with respect to structure, processes and outcomes. Additionally, the method should provide a framework for identifying and analysing quality issues and provide solutions to those issues with the involvement of the concerned stakeholders. The suggested solutions should be transformed to formulate a project, which can be linked with overall organisational strategy. Quality management using the logical framework develops an integrated approach to identifying and analysing issues, suggesting solutions and formulating projects with the involvement of the concerned stakeholders. The

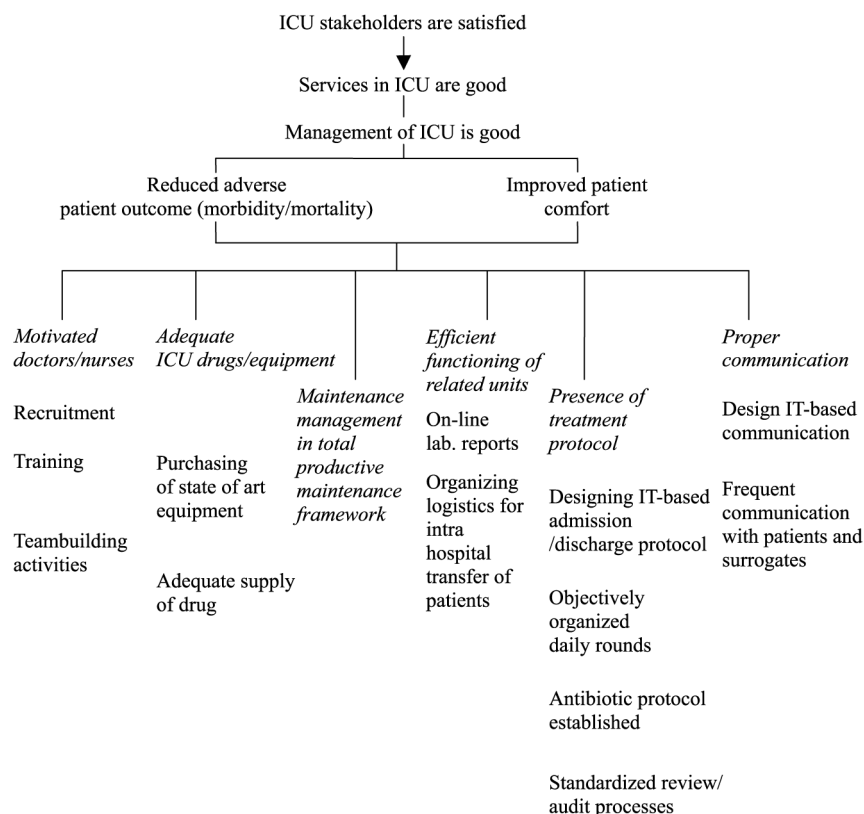


Figure 7.
Objective tree for the Intensive Care Unit (ICU)

“Objectively verifiable indicators” and “Means of verification” column in the framework necessitate appraisal in structure, process and outcomes measures of quality. Additionally, LFA also facilitates the monitoring and evaluation of project dynamically for CQI of the processes. CQI requires continuous performance appraisal through data collection and analysis to ascertain that the improvement measures have been appropriately and effectively implemented (Slovensky, 1996).

LFA offers a uniform model, which can be applied to most of the healthcare units covering both clinical and non-clinical departments. It can be networked with the organisation’s ICT framework in order to improve the involvement of concerned stakeholders in quality improvement.

The proposed quality management approach establishes a link between the organisational learning, resource-based theory and strategic management, which is considered helpful for any organisation to keep an edge over other organisations in this competitive environment (Bitencourt, 2003).

A similar approach may be adopted for managing quality in other service sectors. Identifying problems, suggesting solutions and developing logical framework should be undertaken with the involvement of the representatives of the stakeholders using standard brainstorming sessions. Figure 8 shows a generalised framework for organisational quality improvement programme. Developing a customer focus

Table II.
Logical framework for
Operating Rooms

Objectives	Indicators	Means of verification	Assumptions
<p><i>Goal</i></p> <p>Use of OR by population increases</p> <p><i>Purpose</i></p> <p>Services offered by the OR is effective</p>	<p>Number of patients increases from _ in base year to _ the end of _ year</p> <p>OR utilisation improves from _ in base year to _</p> <p>Surgery on-time improves from _ in base year to _</p> <p>Surgery outcomes improves from _ in base year to _</p> <p>Availability of doctors, nurses, and support staffs increases from _ in base year to _</p> <p>Satisfaction level of doctors, nurses, and support staffs increases from _ in base year to _</p> <p>Down time of the OR equipment reduces from _ in base year to _</p> <p>Down time of the OR system reduces from _ in base year to _</p> <p>Budget</p>	<p>Hospital record</p> <p>OR records</p> <p>Other hospital record</p>	<p>No other equivalent alternative is available</p>
<p><i>Outputs</i></p> <p>1. Doctors, nurses, and support staffs are available for surgery</p> <p>2. Optimised surgery schedule</p> <p>3. Efficient OR system in place</p>	<p>OR records</p> <p>Other hospital record</p> <p>Satisfaction survey report</p>	<p>Availability of the laboratory report on-time</p> <p>Availability of materials resources for surgery</p> <p>Efficient working of other related units, like Intensive Care Unit, Accident and Emergency unit, Infection control etc.</p> <p>Hospital management is committed for excellence</p>	<p>All the activities are effectively planned, executed, and controlled</p> <p>Planned recruitment, promotion, reward/incentive policy and salary structure matches with overall Government policy</p> <p>Changed salary structure is acceptable to the employees</p> <p>User-friendly system can be introduced</p> <p>Availability of fund</p>
<p><i>Inputs</i></p> <p>1.1 Develop new recruitment policy for doctors, nurses, and support staffs</p> <p>1.2 Develop promotion and reward system</p> <p>1.3 Introduce fair salary structure</p> <p>1.4 Improve working conditions</p> <p>1.5 Introduce team development activities</p> <p>2.1 Develop IT-based scheduling and communication program for OR management</p> <p>2.2 Develop an OR management team</p> <p>3.1 Develop a dynamic maintenance program for the OR equipment in total productive maintenance framework</p> <p>3.2 Develop a dynamic inspection and maintenance of OR with proper record</p> <p>3.3 Purchase all state-of-the-art equipment</p>	<p>Budget executing documents</p>		

Objective	Indicators	Means of verification	Assumptions
<i>Goal</i> Use of accident and emergency by population increases	Number of patients increases from _ in base year, to _ the end of _ year	Hospital record	
<i>Purpose</i> Treatment on time	Incidence of adverse patient outcome reduced from _ in base year to _	Accident and emergency records	No other equivalent alternative is available
Reduced adverse patient outcome	Total treatment time/waiting time has been reduced from _ in base year to _	Other hospital record	
<i>Outputs</i> 1. Doctors, nurses, and support staffs are available for services	Availability of doctors, nurses, and support staffs increases from _ in base year to _	Accident and Emergency records	Availability of technology Availability of materials resources for Accident and Emergency services
2. Appropriate triaging	Satisfaction level of doctors, nurses, and support staffs increases from _ in base year to _	Other hospital record	Accident and Emergency services like Intensive Care Unit, General wards, Infection control, etc.
3. Effective patient disposal	Effectiveness of triaging improves from _ in base year to _	Satisfaction survey report	Hospital management is committed for excellence
4. Adequate infrastructure	Adverse patient outcome due to inadequate infrastructure reduces from _ in base year to _		There is no trade union embargo
<i>Inputs</i> 1.1 Develop new recruitment policy for doctors, nurses, and support staffs	Budget	Budget-executing documents	All the activities are effectively planned, executed, and controlled
1.2 Develop promotion and reward system			Planned recruitment, promotion, reward/incentive policy and salary structure matches with overall Government policy
1.3 Introduce fair salary structure			Changed salary structure is acceptable to the employees
1.4 Improve working conditions			User-friendly system can be introduced
1.5 Introduce team development activities			Availability of fund
2.1 Develop appropriate triaging method			
3.1 Develop a list of interrelated functions with other units, which affect patient disposal			
3.2 Improve those functions for effective patient disposal			
4.1 Develop efficient pre-hospital services			
4.2 Develop optimum Accident and Emergency service layout			
4.3 Purchase state-of-the-art equipment			
4.4 Develop a dynamic preventive maintenance program for the Accident and Emergency equipment in total productive maintenance framework			
4.5 Develop a dynamic inspection and maintenance of Accident and Emergency facilities with proper record			
4.6 Develop IT-based communication infrastructure			

Table III.
Logical framework for
Accident and Emergency

Table IV.
Logical framework for
Intensive Care Unit (ICU)

Objectives	Indicators	Means of verification	Assumptions
<i>Goal</i> ICU stakeholders are satisfied	Stakeholders' (patients, doctors, nurses, support staffs) satisfaction increases from _ in base year, to _ the end of _ year	Hospital record	
<i>Purpose</i> Reduced adverse patient outcome (morbidity/mortality)	Adverse patient outcome (morbidity/mortality) reduces from _ in base year to _ in base year to _	ICU records Other hospital record	Socio-economic-political conditions of the country remaining unaltered
<i>Improved patient comfort</i>	Patient comfort improves from _ in base year to _		
<i>Outputs</i> 1. Doctors, nurses, and support staffs are motivated and available	Availability of doctors, nurses, and support staff increases from _ in base year to _	ICU records Other hospital record	Availability of technology Availability of materials resources for ICU services Efficient working of other related units, like general ward, Accident and Emergency unit, Infection control, etc.
2. Adequate ICU drugs/equipment	Satisfaction level of doctors, nurses, and support staff increases from _ in base year to _	Satisfaction survey report	ward, Accident and Emergency unit, Infection control, etc.
3. Maintenance management in total productive maintenance framework	Incidence of non-availability of drug and equipment reduces from _ to _		Hospital management is committed to excellence
4. Efficient functioning of related units	Down time of the ICU equipment reduces from _ in base year to _		Trade union does not have any embargo
5. Effective treatment protocol	Delay of treatment in ICU due to related units reduces from _ in base year to _		
6. IT-based inter-unit and intra-unit communication framework	Dissatisfaction of stakeholders due to treatment protocol has been reduced from _ to _ Incidents of intra- and inter-unit communication delay reduce from _ to _ Budget	Budget-executing documents	All the activities are effectively planned, executed, and controlled Planned recruitment, promotion, reward/incentive policy and salary structure matches with overall Government policy Changed salary structure is acceptable to the employees User-friendly system can be introduced Availability of fund
<i>Inputs</i> 1.1 Develop new recruitment policy for doctors, nurses, and support staff 1.2 Develop promotion and reward system 1.3 Introduce fair salary structure 1.4 Improve working conditions 1.5 Introduce team development activities 2.1 Purchase state-of-the-art ICU equipment 2.2 Supply chain management for ICU drugs 3.1 Develop a dynamic preventive maintenance program for the ICU equipment 3.2 Develop a dynamic inspection and maintenance of other facilities with proper record 4.1 Organise logistics for intra-hospital transfer of patients 4.2 Develop infrastructure for online laboratory report 5.1 Design IT-based admission/discharge protocol 5.2 Organise daily round objectively 5.3 Formulate antibiotic protocol 5.4 Standardised regular review/audit processes 6.1 Design IT-based communication 6.2 Improve discussions with patients and relatives			

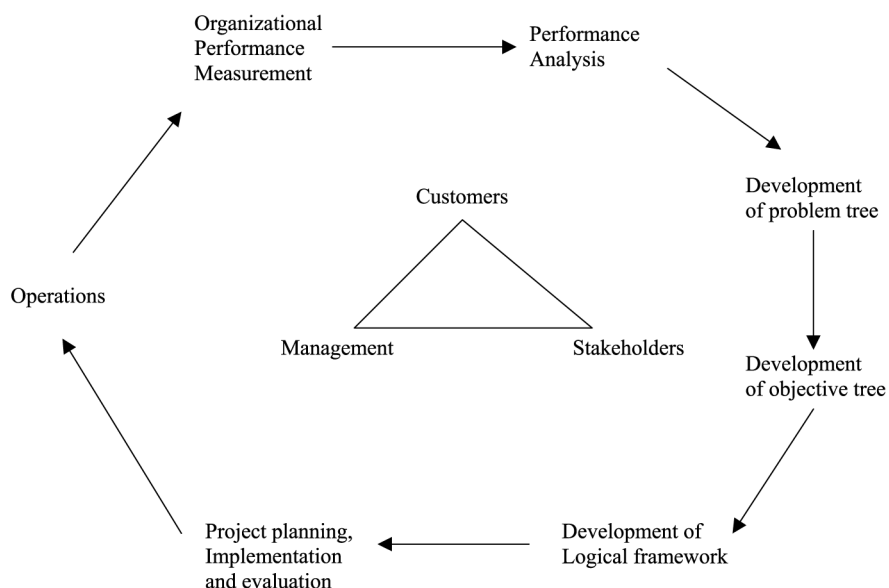


Figure 8.
Generalised quality
improvement model for
organisation

performance measurement framework, analysing performance with stakeholders participation, developing logical framework and implementing projects with management approval ensure superior performance of the organisations.

The proposed holistic quality improvement model using logical framework analysis provides a uniform approach to improve quality of every process. It not only identifies issues pertaining to each process for superior performance and suggests solutions, but also derives a planning framework for implementing improvement projects along with monitoring and evaluation opportunities for dynamic decision-making. This ensures superior performance of the entire system on the implementation of each improvement project. The additional advantage of LFA is that it involves the process owners during analysis (to carry out the stated ten steps). This reveals the real problems of the processes and suggests practical cost-effective solutions and also ensures practising of the improvement measures on implementation. The model incorporates the strategic intent of the organisation by involving management in the decision-making process while approving the project proposal. This ensures management commitment to quality improvement projects during planning, implementation, and operations. LFA provides a CQI environment in the entire organisation with a customer focus. LFA incorporates conventional quality management tools to identify problems and suggest solutions. LFA helps to analyse cost of quality improvement and overall benefit of the organisation. The suggested approach does not provide any prioritising scheme improvement projects. However, the stakeholders can recommend their priority while proposing the project for approval and management makes their own choice with the consideration of the overall goal of the organisation.

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Further reading

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