SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The objective of this paper was to present a description of the step-wise development of an optimized layout of a reporting room of the radiology department in a university hospital.

Systematic Layout Planning of a Radiology Reporting Area to Optimize Radiologists' Performance

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Key Concepts/Context

Literature indicates that the steady increase in the demand for radiological services in the past several years has not been matched by a proportionate increase in the number of radiologists. The authors cite literature stating that patients wait long periods for outpatient radiological services. Healthcare system managers believe that optimizing productivity of radiologists could help address and resolve these issues. One of the key factors identified as affecting the productivity of the radiology department (RD) is the turnaround time of reporting. Turnaround time of radiological reports depends on RD resources and operational characteristics, which among other aspects includes the design of the reporting room. Pointing to the lack of research on this aspect, the authors analyze the existing layout of a reporting room in a university hospital in a Brazilian city to help develop an optimized layout for a new reporting room in the same hospital. The authors use systematic layout planning (SLP) tools to achieve their objective.

Methods

This analytical process was conducted in an 850-bed university general hospital in Porte Alegre, Brazil. Systematic layout planning or SLP, a three-phase process – analysis, research, and selection, was used to develop the layout of a new reporting unit for the radiology division of this hospital. The new reporting unit included the existing reporting room. In the analysis phase of SLP information regarding numbers and types of radiologists, types of radiological exams, output by exam type, mapping of activities, number of workstations, and work scales of radiologists were gathered and analyzed using clustering and relationship analysis. Space requirements and availability were also assessed during this phase.

DESIGN IMPLICATIONS

This paper suggests using systematic layout planning or SLP tools to arrive at an optimized layout

As part of clustering, groups of radiologists were identified and the number of reports (by exam type) generated were obtained from the RD information system. A two-step cluster analysis was then conducted – hierarchical cluster analysis to obtain an ideal number of clusters and k-means analysis to categorize radiologists into different clusters. Data of 31 existing radiologists were analyzed and nine new radiologists were hired – necessitating the layout to accommodate 40 radiologists. A relationship diagram was used to determine the proximity requirements of different sectors within the RD and their potential location within the new unit. The group of stakeholders (radiologists, architects, and hospital managers in this case) then met to assess the available physical space and how it could cater to the requirements of the RD.

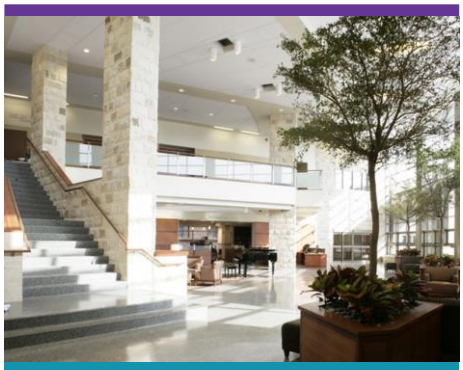
The results of the analyses from the first phase were used during the second phase to prepare different options for the layout. Additional information pertaining to limitations of space, demands of each sector, flow of users, and personal preferences were also taken into consideration after the first layout proposals were presented. Space relationship diagrams were prepared to present different options for the layout. In the last phase the layouts developed in the second phase were evaluated and compared with each other and with the existing layout to finalize the most optimal layout.

Findings

Cluster analysis resulted in grouping the radiologists (by exam type) into four reporting groups: abdomen; musculoskeletal; neurological, vascular, and head & neck; and thoracic and cardiac. Therefore, four working cells were planned in the layout – radiologists with similar expertise or subspecialty working in the same space. The relationship diagram assessed the proximity requirements of the following 13 sectors within the RD – entrance/reception, administrative area, administrative staff and radiologists' relax area, meeting room, reporting room for emergencies (noisy), male and female restrooms, locker room, and four reporting working cells. The requirement was to keep the noisier sectors separate from the quieter sectors. The four reporting areas were located in the quiet area. In all, this step yielded eight options for the new layout.

The eight layouts were compared and evaluated in the research phase of the SLP. The selected layout catered to the following requirements:

- Segregation of the noisy and quiet areas
- More workstations per reporting cell
- Larger rooms for abdominal and thoracic and cardiac subspecialties



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Limitations

The authors did not identify any limitation to their study. One limitation of this paper is that the authors do not indicate if the final layout was effective in increasing radiologists' productivity.