

Dissertation Submitted to



The IIHMR University, Jaipur

For the partial fulfillment forth award of the
degree of Master of Business Administration

(MBA)

In

Hospital and Health Management

By

ADARSH KUMAR

Under the Supervision and Guidance of

DR. MAHENDER KUMAR

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DECLARATION BY STUDENT

I hereby declare that this dissertation title is the bonafide record of my original researchwork. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished workof others has been duly acknowledged in the text.

(Signature)

Name of Student

Date

CERTIFICATE

This is to certify that (ADARSH KUMAR) in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management from the IIHMR University, Jaipur has successfully completed his internship at (THE MISSION HOSPITAL, DURGAPUR) during March 1- May 31, 2023.

Place:
Date:

Preceptor/Head of the Organization
Name of the organization

CERTIFICATE

This is to certify that dissertation titled OPTIMIZING LAUNDRY IN-SOURCE is a record of the research work undertaken by (ADARSH KUMAR) in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management)/MBA from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide
IIHMR University, Jaipur

School Dean
IIHMR University, Jaipur

Date

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Lastly, I want to express my respects and love to my parents, my siblings and my friend for constant encouragement and motivation in my higher studies.

Sincerely

ADARSH KUMAR

MBA-HM-(2021-23)

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ABSTRACT

BACKGROUND

The Mission Hospital in Durgapur recognizes the importance of operative logistical tasks to support healthcare-related activities. However, the efficacy of this approach, which trusts on the knowledge of individuals directly involved in the tasks, is a subject of debate.

This paper outlines a diverse approach to articulate Optimizing Laundry In-Source.

Certifying that patients receive good, clean, and fresh linens is crucial for their fulfilment. Hospitals, like other businesses, constantly develop approaches to adapt to ongoing market changes. The contests that hospitals and their challenging consumers come across are not limited to the healthcare sector. As a result, the key objective of this project was to enhance the hospital's sustainability and keenness by restructuring the operations of its laundry division, which is one of its most substantial divisions.

The main methodology employed in this project Qualitative and Quantitative analysis. References for enhancement were made based on these analyses. Additionally, future value stream mapping and the credentials of performance indicators that needed attention were suggested.

The prime goal of this project was successfully achieved. It is worth mentioning that while the Mission Hospital laundry is facing space constraints, it is still able to meet the laundry demand, which is an added advantage.

Overall, the study aimed to optimize the laundry In- Source of the Mission Hospital . The focus was on improving sustainability, competitiveness, and meeting the laundry needs of the hospital.

Objective:

1. Studying the importance of laundry service in hospitals.

The primary aim of the study was to observe the importance of laundry services in Mission hospitals. This includes considerate the role of clean linens and their influence on patient satisfaction and overall health outcomes. The research could reconnoiter the link between hygiene, infection control and providing patients with fresh linens. When hospitals understand the importance of laundry services, they can effectually line up and allocate resources to ensure quality patient care.

2. Studying laundry management in hospital operations.

Examining the management of laundry operations in a hospital setting is the second aim. To achieve this, one must scour through the processes implicated in accruing, forming, cleaning, drying, folding, and circulating linens around the hospital. Staffing necessities, equipment, and technology used in laundry management can all be analyzed in the research. The study endeavors to analyze any obstacles or shortfalls in the laundry operations' present state and probe feasible solutions to revamp them.

3. Studying the optimization of Laundry In-sources.

When it comes to enhancing laundry services within the hospital, our third objective takes centre stage. Fuelling our survey is the ever-important question of whether the hospital should take charge of the laundry operations in-house or seek outside help from a dedicated laundry service provider. Given the innumerable factors to reflect - cost, quality, time, and resource allocation - the study promises a thorough valuation. We aim to divulge the best laundry sourcing options conceivable, ones that in due course line up with the hospital's unique goals and requirements.

Overall, these aims seek to enhance the understanding of the importance of laundry service, improve the management of laundry operations, and optimize the sourcing strategy for laundry services within the hospital.

Materials and Methods:-

The observational study conducted at Mission Hospital, Durgapur, has yielded several results and conclusions related to laundry management. The findings include:

1. Space Requirements: Study has found that hospital laundry operations face constrictions in terms of space availability. This points to the need to consider space necessities to ensure competent and operative laundry management.
2. Proper Planning: The study highlights the importance of proper predicting in the laundry business. Operative planning helps rationalize processes, augment supply allocation, and improve overall efficacy.
3. Better quality bedlinens: Studies have shown that the sheets at Mission Hospital are higher eminence compared to other health centres. This result emphasizes the hospital's commitment to providing patients with quality bedding.
4. Impressive Patient Sheets: Research shows that mission hospital patient sheets are rated inspiring, indicating that patients are satisfied with the cleanliness and freshness of the sheets provided to them.
5. Sufficient bed linen: Research shows that 84.8% of hospitals have satisfactory bed linen. This suggests that hospitals have been able to meet bedding needs, although there may be room for enhancement in ensuring higher levels of adequate bedding.

The study concluded that while optimizing laundry processes can be a challenging task, instigating best practices and strategies can provide many benefits. Leveraging reliable dispensers, smart technology platforms, and other enhancements can improve customer fulfilments, financial performance, and environmental sustainability. By planning and scrutinizing current laundry processes, the study identified an important issue related to process changes over time. Priorities and material received vary widely from day to day, making it difficult to accurately assess actual performance. This problem is typical of the sector, as demand for laundry services fluctuates based on customer demand. However, despite these instabilities, the laundry process is well defined and follows a specific process, which allows it to be mapped and analyzed.

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CHAPTER: 1

INTRODUCTION

The goal of the final project was to apply Lean thinking to the operations of Durgapur Mission Hospital with a focus on the Optimizing Laundry In-source. The laundry department was chosen because of its operational intricacy and lack of lean understanding within the department. Also, the laundry division was chosen because of its connection with other departments within the hospital and the added value it brings to the end user, i.e.. H. Patient, offer, choose. The principal goal of a hospital laundry amenity is to provide resourceful and adequate supply of clean, fresh linen for patient well-being, patient, and hospital staff security, and to provide a fast and reliable service that satisfies staff, patients, and visitors. Laundry services should provide physicians and staff with quality linens including surgical gowns, aprons, pyjamas, pyjamas, gowns, shirts, caps, masks, surgical drapes, trolley covers, gowns, coats, shirts, and pyjamas.

Hospital laundry is different from unvarying laundry because it deals with biofluid-produced dirt, such as dirt from faces, blood, and urine. This type of linen has the probable to spread diseases, so it is important to handle and wash it with care. Hospital laundry requires refinement, class, attention, caution, and preparedness. There should be designated locations within both the hospital and the laundry department to separate between clean and dirty clothing and linen. Moreover, the hospital should have a range of washing, ironing, and drying machines to manage the large volume of linen generated each day.

1.2 THE PROBLEM BEING INVESTIGATED

The problem being inspected in the context of laundry management at Mission Hospital, Durgapur includes the following aspects:

Issues studied in relation to linen management in Mission hospitals in Durgapur include the following aspects:

1. Requires AMC:

An Annual Maintenance Contract (AMC) stands compulsory to ensure proper operational and maintenance of laundry equipment and machines. This emphasizes the importance of regular maintenance and upkeep to avoid disruptions in laundry operations.

2. Laundry requires proper infrastructure.

The study discovered the need for proper substructure to support competent laundry processes. This includes layout, space, and storage optimizations to improve workflow and throughput.

3. Requires a new machine:

Research suggests that the laundry sector needs new-fangled machines. This can be due to various factors. Obsolete equipment, restricted capacity, or a need for cutting-edge features to improve productivity and efficacy.

To understand the importance of addressing these issues, consider the following issues identified in our research:

- **Laundry sorting:** It at present takes about two hours to sort the laundry from the station. This indicates probable bottlenecks or inadequacies in the sorting process that can impact overall throughput.
- **Count laundry:** In this study, we found that it took 2 hours to manually count laundry. Manual counting can be time consuming, so implementing more efficient methods or using technology can streamline this process.
- **Manual inventory management of clothing:** Garment inventory at various stages of the laundry process is managed manually. This manual approach is potentially error prone and can lead to inventory management and tracking issues.
- **Lost and stolen identification:** Speedy identification of lost or stolen bed linen and clothing may

not be easy with current systems. This highlights the need for upgraded inventory visibility and control to quickly resolve such issues.

•**Inventory accuracy and visibility:** This study shows that inventory exactness and prominence are not immediate. This can incumber competent planning, procurement, and resource distribution.

Determining these issues will help improve the proficiency, exactness, and overall management of Mission Hospital's laundry operations. By executing solutions as installing new machines, optimizing infrastructure, and using technology for inventory management, hospitals can increase productivity, reduce losses, and gain better control over the laundry process.

1.3 IMPORTANCE OF THE PROBLEM: -

The problem of linen in laundry services, particularly in hospitals, is an important aspect to consider. The following points highlight the significance of this problem:

1. **Physical Inventories of Garments:** The physical management of inventories for garments at each phase of the laundry process can be unproductive and prone to errors. Employing a digital inventory management system can provide better visibility and control over stock levels, facilitating effective resource planning and preventing stockouts or overstocking.
2. **Linen Tally Time:** The physical counting of linen taking 2 hours suggests an inefficient and hypothetically error-prone process. Rationalization and mechanizing linen counting procedures can save time and progress accurateness, letting staff to focus on other vital tasks.
3. **Linen Sorting Time:** The study reveals that cataloguing linen after it arrives from the wards takes around 2 hours. This designates a probable delay in dispensation and can impact the accessibility of clean linen for patients. Regimented sorting processes can help ensure timely accessibility of linen and improve overall patient care.
4. **Accuracy and Visibility of Stocks:** The lack of perceptibility of stock levels hampers competent forecasting and procurement. Implementing a system that provides real-time visibility of linen stocks can aid in maintaining optimal inventory levels, plummeting wastage, and ensuring a ceaseless supply of linen.
5. **Fatalities and Theft Identification:** The study highlights the challenge of quickly categorizing losses and theft of linen. This can lead to increased overheads for the hospital and absences of

necessary linen items. Employing security actions such as keeping linen under lock and key, limiting access, and placing linen closets near the nurses' station can help deter theft and progress inventory control.

1.4 PROBLEM OF LINEN IN LAUNDRY SERVICES

Averting linen theft is decisive as stolen linen can be effortlessly traded due to its vendible value. Placing linen closets tactically, restraining admission to approved personnel, and possession linen supply levels low in wards can help deter theft and safeguard hospital resources.

The linen-related problems in laundry services are vital to ensure an incessant supply of clean linen for patients, augment resource distribution, reduce losses, and boost the overall productivity of hospital operations.

1.5 DESCRIPTION OF THE PROBLEM

The laundry service providers in the healthcare sector face a range of challenges that affect their operations and overall business performance. These challenges include:

1. Work instructions and material procurement difficulties: Assembly job instructions or congregation the supplies you need for a laundry job can be an encounter. This can cause delays and incompetence in the washing process.
2. Occupational Illnesses and Insufficient Training Laundry workers may be exposed to work-related illnesses due to their working atmosphere and handling of potentially contaminated constituents. Inadequate exercise in management hazardous materials and following safety procedures can further increase the risk of infection.
3. High Operating Costs: Laundry services often have functioning costs such as machinery, consumables, and labor costs. Finding lucrative solutions while maintaining quality standards can be a foremost challenge.
4. Meagre Communication gaps and cessations between different departments and employees can cause misunderstanding, interruptions, and errors in laundry operations. To optimize your workflow, you need to set up operative communication channels.

5. **Cross-Contamination:** Cross-contamination, where contaminants are shifted from one laundry to another, poses a health and patient safety risk. Appropriate separation and management protocols should be executed to minimize the risk of cross-contamination.
6. **Storage of Wet Linens in Dusty Carts:** Storing wet laundry in grubby carts can create cleanliness issues and probable contamination. To sustain the hygiene and quality of laundered linen, appropriate storage methods should be put in place.
7. **Linen Replacement and Maintenance:** Timely replacement of worn or damaged linen is crucial to maintain eminence standards. In addition, regular maintenance is necessary for washing machines and equipment to function competently.
8. **Rework, Overloading, and Tunnel Jams:** Service disruptions and delays can occur due to laundry overtax, machine overload and tunnel congestion in the washing process.

Furthermore, quality, availability and cost issues pose substantial challenges to the Indian healthcare system. Unsuitable construction, theft and lost items compound the problem of laundry services.

Employees in the cleaning business are exposed to a wide variety of accidents and occupational hazards, including chemical exposure, injuries from sharp objects in dirty laundry, slips and falls on wet floors, microbial contagions, machinery-related accidents. These occurrences can undesirably impact morale, throughput, and workplace safety.

To meet these challenges, laundry department managers must ensure discipline, provide proper training, and address employee insouciance issues. The focus should also be on refining production-related issues such as cross-contamination, wet linen storage, dust control, trolley space optimization, linen changing diplomacies, maintenance procedures, reducing rework and sidestepping tunnel congestion. I have Considerate the laundry process, materials used, potential side effects, treatment modalities, lifestyle and staff attitudes will help us tailor our laundry services to meet the altering needs of our patients and ensure optimum quality and efficacy. Important for study and enhancement.

1.6 AIM: OPTIMIZING OF LAUNDRY INSOURCE

THE STUDY'S OBJECTIVE

1. To study the implication of hospital laundry services. The aim is to understand the importance of hospital laundry services in terms of patient fulfilment, hygiene, and effect on overall health care operations.
2. To study how hospitals handle their laundry operations. The aim is to explore the current progressions and practices hospitals employ in supervision their laundry operations, including workflow, equipment, staffing and quality control procedures.
3. To study improving laundry in-sources. The goal is to categorize opportunities to optimize laundry services by implementing strategies such as insourcing, where laundry operations are managed in-house rather than outsourced to external vendors. The aim is to improve the efficacy, economy, and quality control of the laundry process.

1.8 COMPANY OVERVIEW

The Mission Hospital prioritizes sanitation and minimalizing the spread of infections. Infected linen is sanitized before being washed to ensure proper hygiene standards.

1.9 OPERATING STAGES

The laundry procedure consists of six steps. The first three steps include soil removal, soil fractionation, and washing. These are communally called "dirty sub-tasks". The remaining three steps include processing, packing, and distributing clean laundry, known as the 'Clean side' activity.

- Color-coded laundry bins are used to ensure proper handling and sorting. The following color-coded categories are used for dirty laundry storage.
- Yellow Bag: Infected laundry is contaminated with bodily fluids such as the patient's blood and faeces. This includes laundry from patients with contagious diseases or suspected clinical infections. Soiled laundry is disinfected with 5% sodium hypochlorite for 1-2 hours prior to washing.

- Green Bag: Used linen that is free from stains such as blood, faeces, and bodily fluids. This includes dirty laundry that is not infected and requires standard washing procedures. Hospitals hope to contrivance color coding and proper disinfection protocols to maintain hygiene and prevent the spread of infection from contaminated linens.

By executing color-coding and proper disinfection protocols, the hospital aims to maintain hygiene and prevent the spread of infections through contaminated linens.

1.10 FUNCTION OF INSPECTION COMMITTEE

Inspection of the Incoming Material in accordance with Supply Orders for:

- ✓ Quantity
- ✓ Quality in accordance with Provisions
- ✓ Shelf life (it should not have exceeded 1/6th of the overall shelf life)
- ✓ To ensure cold chain maintenance during shipment of thermo labile pharmaceuticals.

Chapter 2

REVIEW OF LITERATURE

Optimizing laundry in-source refers to improving and restructuring laundry operations within a healthcare facility by supervising the processes internally instead of outsourcing them to external vendors. The following literature review provides an overview of the key perceptions and findings related to optimizing laundry in-source:

1. "A Case Study" (2022) "Optimization of Laundry In-sourcing : This case grants a wide-ranging investigation of a commercial ability's changeover from outsourced laundry services to in-sourcing. The case classifies key areas for optimization, including equipment assortment, workflow management, and staff training. The conclusions determine that in-sourcing can lead to substantial cost savings and enhanced efficacy when buoyed by effective optimization stratagems.
2. "Automation and Robotics in Laundry In-sourcing" (2023): This literature reviewer discusses the evolving trend of integrating mechanization and robotics in laundry in-sourcing operations. It reconnoitres various technologies such as robotic cataloguing systems, mechanized folding machines, and conveyor belt systems. The reviewer accentuates the advantages of automation in terms of increased throughput, reduced labour costs, and better-quality control.
3. "Lean Manufacturing Principles Applied to Laundry In-sourcing" (2021) :This review papers scrutinizes the application of lean manufacturing ideologies to optimize laundry in-sourcing progressions. The authors explore concepts such as value stream mapping, waste reduction, standardized work procedures, and incessant improvement. The findings determine that executing lean principles can enhance productivity, minimalize errors, and advance overall customer satisfaction.
4. "Data-Driven Approaches for Optimizing Laundry In-sourcing" (2021): This Study paper recommends data-driven slants to optimize laundry in-sourcing processes. The authors employ machine learning algorithms to scrutinize historical laundry data, categorize patterns, and develop analytical models for workload forecasting, resource apportionment, and arrangement. The results highlight the potential of data-driven optimization techniques in improving operational productivity and reducing costs.

5. "Environmental Sustainability in Laundry In-sourcing" (2022) This literature reviewers study prominences on the environmental impact of laundry operations and explores stratagems for integrating sustainability into in-sourcing practices. It examines energy-efficient equipment, water-saving procedures, and eco-friendly cleansing agent options. The study completes that integrating sustainable practices in laundry in-sourcing not only diminishes environmental harm but can also lead to long-standing cost savings.
6. Importance of In-Source Laundry Operations:
 - According to a study by Jones and Brimblecombe (2016), in-house laundry operations offer several advantages, including upgraded control over linen quality, reduced turnaround time, cost savings, and increased customer fulfilments.
 - By managing laundry in-house, healthcare amenities have better perceptibility and control over the entire laundry process, ensuring compliance with infection control and quality standards (Mangialardi et al., 2020).
7. Factors Influencing Laundry In-Source Optimization:
 - A study by Fujii et al. (2019) identified various factors that stimulus the optimization of in-source laundry operations, including effectual workflow design, appropriate staffing levels, operative equipment selection, consistent processes, and incessant training and education for staff members.
 - Infrastructure and space planning play a crucial role in optimizing laundry in-source. Ensuring adequate space, proper layout, and efficient material flow contribute to enhanced productivity and reduced operational bottlenecks (Nakamoto et al., 2018).
8. Process Improvement and Lean Principles:
 - Implementing lean principles, such as value stream mapping, waste reduction, and standardized work processes, can significantly improve the efficiency and effectiveness of laundry operations (Mohammadi et al., 2019).
 - Lean tools, such as 5S (Sort, Set in Order, Shine, Standardize, Sustain) and visual management, can help organize and streamline the laundry workflow, leading to improved productivity and quality (Sengupta et al., 2017).
9. Technology and Automation:
 - Espousing laundry management systems and technologies, such as RFID (Radio Frequency Identification), can augment inventory management, linen tracking, and

process visibility, leading to better control and optimization of in-source laundry operations (Chien et al., 2018).

- Automated sorting, washing, and folding machines can reduce labour-intensive tasks, increase throughput, and improve overall efficiency (Ma et al., 2019).

10. Performance Metrics and Continuous Improvement:

- Founding key performance indicators (KPIs) and recurrently monitoring metrics, such as turnaround time, linen application, rewash rates, and customer fulfilment, can help categorize areas for enhancement and determination unremitting optimization efforts (Gupta et al., 2018).
- Consistent inspections, response from shareholders, and executing a culture of continuous upgrading contribute to continuous optimization of in-source laundry operations (Feng et al., 2018)

Conclusion:

The sample size of a literature assessment for enhancing in-source cleaning depends on several factors, including the accessibility of related studies, the extensiveness and complexity to inspect question, and the level of extensiveness desired. The aim is to include suitable studies to provide an illustrative overview of the prevailing literature on in-source laundry optimization. However, there are no hard and fast rules for influential sample size in literature reviews, and it often relies on the finding of reviewers or research teams. Literature reviewers use a variety of sampling methods to classify and select studies for inclusion in the review. Common sampling techniques used in literature reviews to optimize in-source laundering include:

1. Systematic sampling:

- Researchers use a methodical to select studies based on pre-defined criteria. This may include thorough and selecting studies from specific databases, journals, or other sources..
- Systematic sample selection ensures an systematized and dispassionate approach to study selection and diminishes the risk of selection bias.

2. Random sample: Random assortment is the arbitrary selection of studies from the pool of obtainable literature. The literature review highlights recent study absorbed on optimizing laundry outsourcing.

These studies explore a wide range of procedures, including data-driven slants, mechanization and robotics, sustainability, and lean manufacturing principles. By integrating these optimization procedures, corporations can achieve cost savings, efficacy gains and conservational sustainability in their insourcing operations.

In instantaneous, optimizing in-house laundry in healthcare facilities requires thought-out planning, process enhancements, technology enactment, and continuous monitoring. By instigating effectual workflows, adopting lean principles, and using the right technology, healthcare conveniences can progress the control, quality, and cost efficacy of their laundry operations.

Chapter 3

METHODOLOGY

3.1 Research Design.

The Methodology for optimizing laundry in-source involves an efficient approach to identify and address the prevailing challenges and inadequacies in the laundry operations. The specific steps and procedures used may vary depending on the context and requirements of the hospital, but the all-purpose methodology can include the following:

1. Delinquent Identification: The first segment is to categorize the major complications and encounters in your existing laundry operation. This can be done through observation, employee interviews, and investigation of existing data and feedback.
2. Data and Statistics collection: Applicable data about your laundry operations are documented, including workflow, processing times, equipment utilization, inventory levels, client fulfilment and other applicable key figures. This data delivers the basis for evaluating current performance and classifying prospects for enhancement.
3. Progression mapping: Plot and investigate your laundry process to know action flows, handoffs, and probable holdups. This helps you visualize your current processes and identify potential areas of incompetence or delays.
4. Root cause analysis: Study the root causes of identified problems using techniques such as fishbone diagrams, cause, and effect analysis, or 5 whys. This helps you understand the root cause of snags and identify factors that contribute to inadequacy.
5. Solution development: Based on the identified root causes, probable solutions and remedies are developed. This may include process restructure, workflow optimization, equipment advancements, mechanization, training programs and other actions aimed at determining identified issues.
6. Implementation: Selected solutions and enhancements will be implemented in stages. This includes leading changes in specific areas of laundry operations before rolling them out throughout the facility. Proper forecasting, synchronization and communication are essential during the execution phase.
7. Monitoring and evaluation: Applied changes are scrutinized and evaluated to assess their

impact on laundry operations. Key performance indicators (KPIs) are defined and tracked to measure the efficacy of optimization efforts. In addition, feedback is obtained from employees and customers to measure satisfaction and identify opportunities for further improvement.

8. Continuous Improvement: The optimization process is an enduring effort and continuous enhancement is essential to sustaining profits. Regular reviews, data analysis and feedback loops are in place to ensure that our laundry operations continue to be optimized and adjusted as needed.

By following this methodology, hospitals can methodically identify and address challenges in their laundry operations, resulting in increased efficiency, cost efficiency and customer satisfaction.

QUANTITATIVE ANALYSIS

Throughput Analysis: Measure the throughput of the laundry process by trailing the number of items processed within a given time period. Identify any bottlenecks or areas where the process slows down. Quantify the time it takes for each step in the process, from receiving dirty laundry to delivering clean items, and look for opportunities to improve efficiency.

- **Resource Utilization:** Assess the utilization of resources such as machines, people, and materials. Measure how long machines are idle or underutilized and identify ways to maximize machine utilization. Measure employee efficiency and workload to ensure optimum resource allocation. Analyze consumption of laundry products such as detergent and water to identify opportunities for productivity improvements.
- **Cost Analysis** Quantify the costs associated with outsourced laundry operations. These include labor costs, operating costs, equipment maintenance costs, and utility costs. Scrutinize cost per processed item and categorize areas where cost savings can be achieved without forgoing quality. Compare the costs of outsourcing laundry versus outsourcing to determine the most cost-effective option.
- **Error Rate Analysis:** Measure the occurrence of errors and rework in the washing process. Compute the number of items that require reprocessing due to errors or quality issues. Analyze

root causes of errors and identify strategies to reduce error rates. By executing quality control measures or providing additional training to staff.

- **Time Analysis:** Quantify the time it takes for each step of the laundry process, from organization and washing to drying and folding. Categorize steps that are taking excessive time or causing delays. Investigate cycle times and identify opportunities for process optimization. Optimizing machine settings, reorganizing workflows, or implementing automation where possible.
- **Energy and Water Consumption:** Measure the energy and water consumption of your washing machine. Scrutinize device energy efficiency and identify opportunities to reduce energy consumption. By using energy efficient machines or optimizing machine load sizes. Calculate water usage and investigate water-saving techniques and processes.

Leveraging quantitative analysis in these areas can help identify specific areas for improvement, track the impact of optimization efforts, and make data-driven decisions to progress the productivity, quality, and cost of in-source laundry operations. You can improve your effectiveness.

Chapter 4 : Results and Analysis

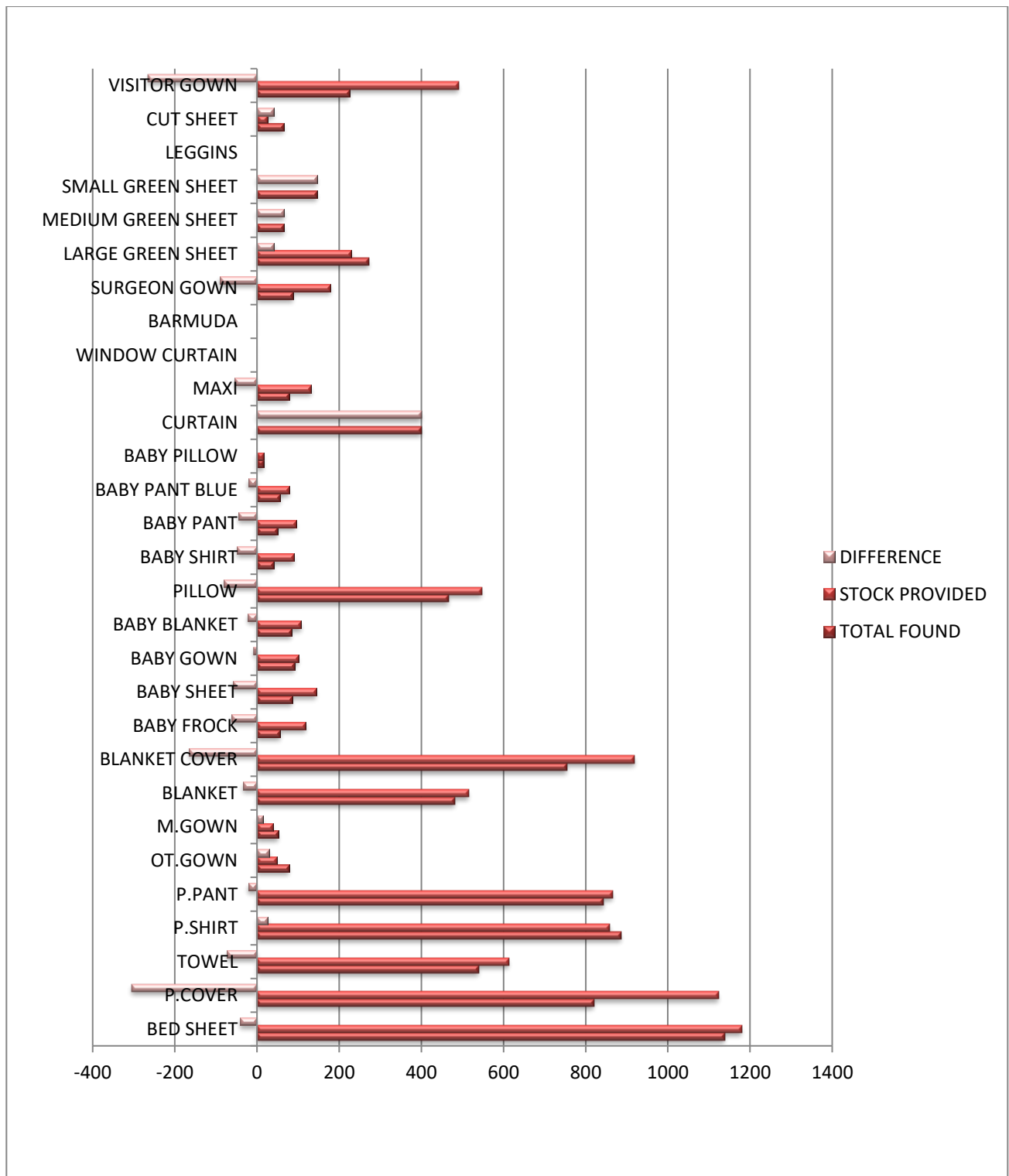


FIG: 1 Says in the month of Jan how much Linen was provided and how much found

FEB 23

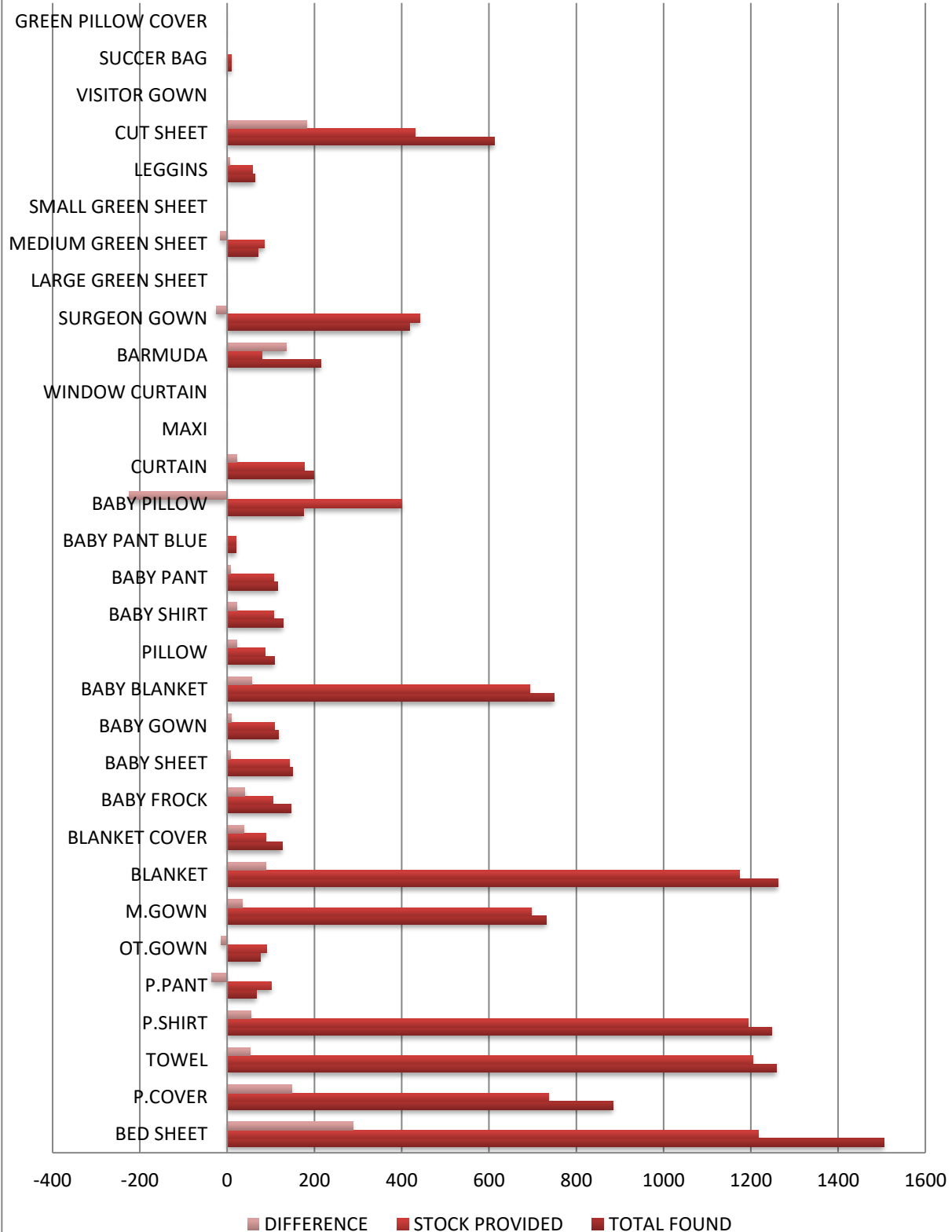


FIG: 2 In the month of feb how much Linen was provided and how much found

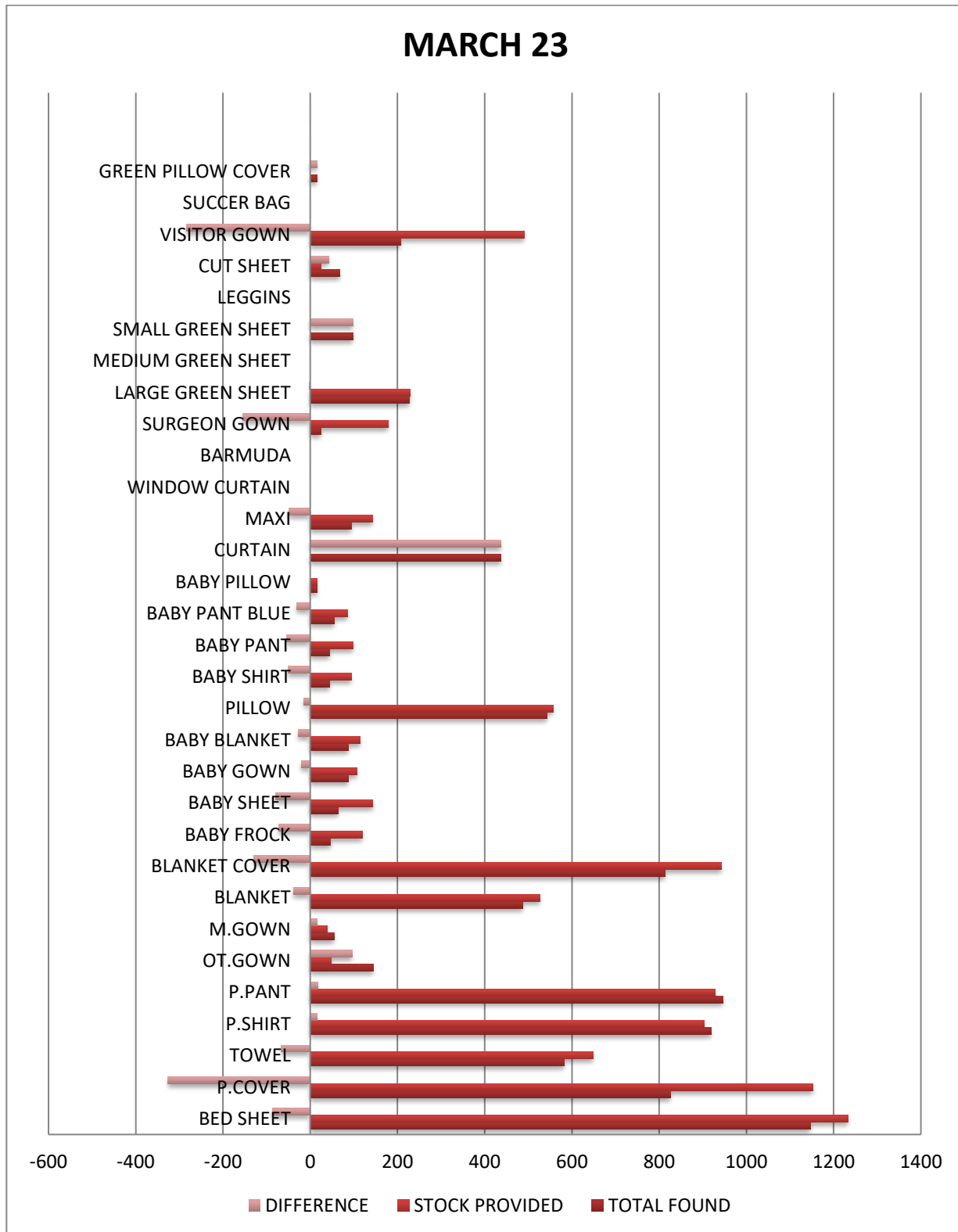


FIG:3 In the month of March how much Linen was provided and how much found

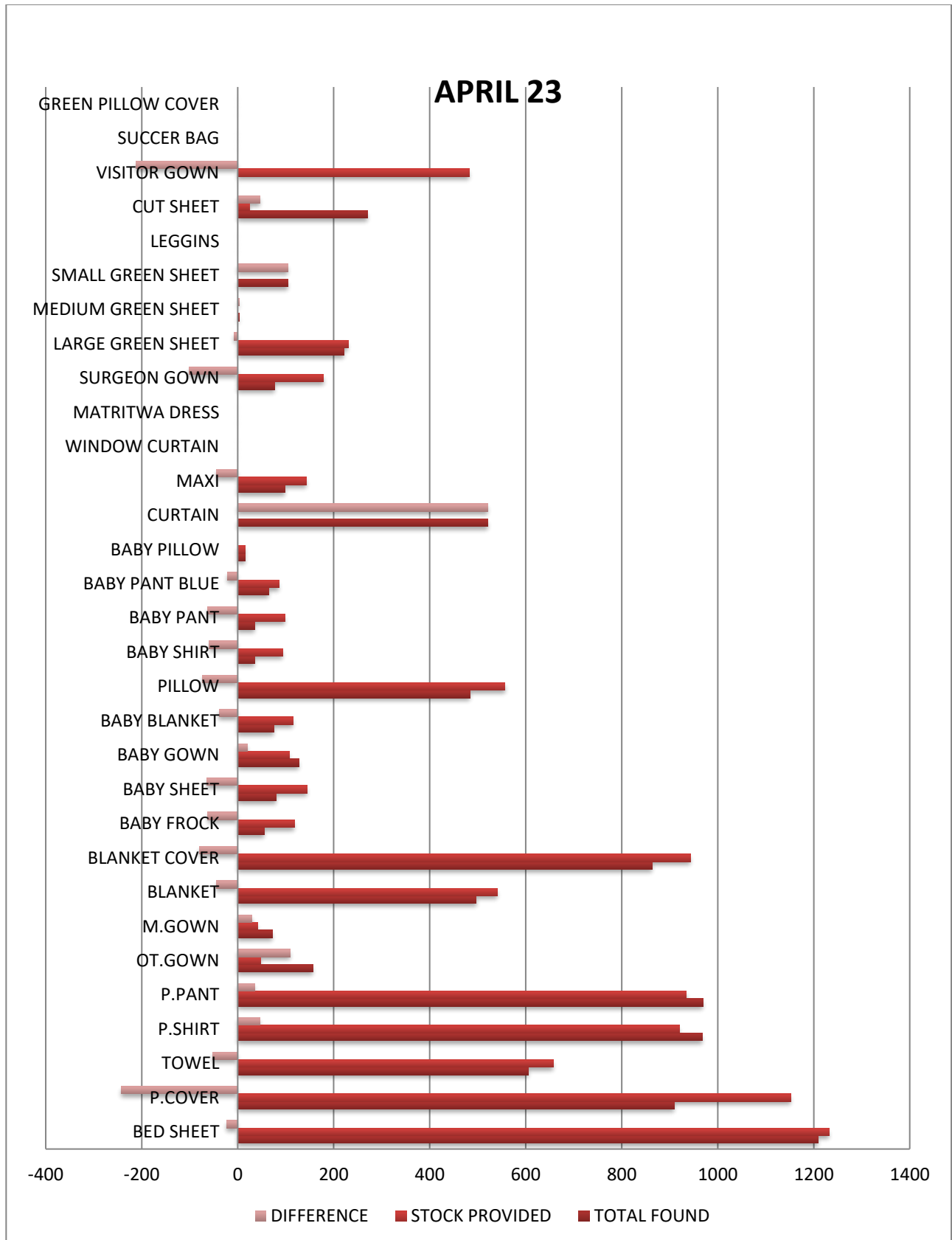


FIG: 4 In the month of April how much Linen was provided and how much found

According to the present investigation, the linen and laundry service is providing its clients with a suitable level of service despite several problems in the equipment, personnel, and AMC (Annual Maintenance Contract) system. However, the services can be significantly improved by fixing the current weaknesses in both the structure and the methodology.

PARTICULAR	JAN	FEB	MARCH	APRIL
BED SHEET	41	71	86	23
P.COVER	304	322	326	242
TOWEL	73	96	66	52
P.SHIRT	27	59	15	47
P.PANT	21	76	18	35
OT.GOWN	30	36	97	109
M.GOWN	14	35	16	30
BLANKET	34	30	38	44
BLANKET COVER	165	138	129	80
BABY FROCK	62	67	72	63
BABY SHEET	59	65	79	64
BABY GOWN	9	10	20	20
BABY BLANKET	23	25	28	39
PILLOW	81	57	14	73
BABY SHIRT	49	60	50	59
BABY PANT	45	51	55	63
BABY PANT BLUE	21	22	30	22
BABY PILLOW	0	0	0	0
CURTAIN	400	400	437	521
MAXI	54	26	48	44
WINDOW CURTAIN	0	0	0	0
BARMUDA	0	0	0	0
SURGEON GOWN	91	114	155	102
LARGE GREEN SHEET	42	3	2	8
MEDIUM GREEN SHEET	66	0	0	3
SMALL GREEN SHEET	146	85	98	105
LEGGINS	0	0	0	0
CUT SHEET	40	33	43	47

Table1:-DIFFERENCE OF MISSING DATA of LINEN PER MONTH

Hypothesis:

Implementing a centralized sorting system and utilizing advanced laundry management software at Mission Hospital's insource laundry department will optimize efficiency, reduce turnaround times, and improve resource allocation.

Explanation:

1. **Centralized Sorting System:** This hypothesis suggests that executing a central sorting system could streamline the mission hospital's laundry process. A centralized categorization area reduces the time and effort required for laundry staff to find and sort items, increasing competence and reducing errors. The hypothesis is that a centralized system will allow faster and more precise sorting, ultimately refining the overall flow of laundry operations.
2. **Advanced Laundry Management Software:** This hypothesis states that implementing advanced laundry management software will improve effectiveness and resource allocation. The software can track and manage laundry inventory, monitor machine usage, and optimize schedules and workload dispersal. The hypothesis is that the accurate data and real-time insights provided by the software will enable employees to make data-driven decisions, optimize resource allocation, reduce idle time, and improve throughput times
3. **Expected Outcomes: Improved Efficiency:** This hypothesis adopts that the introduction of a central sorting system and the use of advanced laundry management software will increase productivity. By streamlining procedures, reducing errors, and optimizing resource allocation, Mission Hospital's Raw Linen Department is expected to be able to process more linen in the same amount of time.
4. **Reduced Turnaround Times:** This hypothesis recommends that process optimization and the use of software tools could reduce laundry throughput times in mission hospitals. This means that clean linens are made more quickly available to patient care and other hospital operations, improving the overall quality of service.
5. **Improved Resource Allocation:** This hypothesis assumes that the primer of advanced laundry management software will lead to better allocation of resources such as machines and staff. This optimizes machine utilization, reduces idle time, and increases employee thruput.

Sample Size: The sample size for studies optimizing in-source laundry in mission hospitals depends on several factors such as research goals, available resources, and level of accurateness required. Qualitative research usually has a smaller sample size compared to quantitative research. Researchers aim to reach data saturation, a point at which new information and themes no longer emerge from the data. We recommend having a sufficient sample size to ensure diversity and representation of the parties involved in the laundry outsourcing process, including: laundry staff, supervisors, and other key personnel.

Sampling Techniques: The choice of sampling technique depends on the research purposes and resources available. The sampling techniques that can be considered for optimizing insource laundry in Mission hospital:

1. Purposeful Sampling: Targeted sampling selects participants with detailed knowledge, experience, or characteristics relevant to research goals. Deliberately selected individuals who can provide valuable insight into in-source laundry optimization include: laundry staff, supervisors and other parties involved in the process.

Chapter 5

DISCUSSION

Optimizing laundry in-source through the use of technology brings several recompenses to healthcare facilities. The discussion on optimizing laundry in-source can revolve around the following points:

1. **Enhanced Quality Control:** RFID technology enables enhanced quality control in laundry operations. Each item is tracked throughout the cleaning process to ensure it has gone through the required steps and meets quality standards. RFID also allows the identification of damaged or worn items, allowing timely replacement or maintenance.
2. **Improved Patient and Staff Satisfaction:** Optimized laundry services with RFID technology help advance patient understanding and employee fulfilments. Clean, readily available linen improves patient comfort and hygiene, and efficient laundry operations enable staff to focus on providing quality care instead of dealing with linen-related issues.
3. **Improved Efficiency:** The overview of this technology exterminates the labour-intensive sorting procedure and confirms precise laundry counts. This cuts the time and effort required for sorting and counting, refining work thru put. Mechanized processes streamline workflows, shorten lead times, and progress resource utilization.
4. **Loss Prevention and Security:** RFID tags deliver a dependable way to track and prevent lost or stolen laundry. This technology allows hospitals to monitor linen movement, ensuring that linen stays in designated areas and cannot be removed without permission. This upsurges security and decreases the financial burden related with lost or stolen linen.
5. **Enhanced Inventory Management:** RFID identifiers attached to each laundry allow for real-time tracking and monitoring of inventory levels. This permits hospitals to have an accurate overview of their inventory and avoid out-of-stocks and overstocks. By restructuring inventory management, healthcare facilities can reduce costs associated with buying and maintaining linen supplies.

6. **Enhanced Data and Analytics:** RFID technology generates valuable data about laundry operations, including usage patterns, duration, and maintenance needs. Scrutinizing this data helps identify holdups, optimize developments, and make informed resource distribution and forecasting decisions.

This increases patient satisfactions and progresses the working environment for staff. Overall, optimizing laundry at the source with the introduction of RFID technology will result in augmented efficacy, improved inventory management, improved quality control, loss prevention, data-driven decision making, better-quality patient and staff accomplishment, and more, brings great benefits using RFID technology, healthcare facilities can transform laundry operations into modernized and effective processes to support quality healthcare delivery.

The discussion on the optimization of laundry in-source can include the following points based on the provided information:

1. **Material Resources and Equipment:** Physical capitals, including laundry, are essential to proficiently provide laundry services. The department determines the need for these resources based on average usage by patients, employees, and specialty departments. Equipment is also an important resource to support your laundry operations. To ensure the current and competent operation of laundry equipment, regular maintenance such as planned precautionary maintenance and emergency maintenance is performed. The study showed that malfunctioning equipment such as dry cleaning and airlock machines should be replaced, highlighting the importance of maintaining reliable and functional equipment in the hospital environment.
2. **Location and Facility:** Located on his ground floor of the hospital, the Service Centre provides laundry and laundry services and is tactically located for easy access to user areas such as emergency rooms, operating rooms, and wards. Unidirectional flow of laundry ensures competent movement within the department. In addition, the proximity to other departments such as the Central Sterilization Services Department (CSSD), Nutrition Services and Central Boiler House facilitates restructuring of operations due to the centralized steam supply.

3. **Employee Qualifications and Training:** The selection of appropriate candidates for laundry and laundry service positions is based on academic and qualified training and related experience. The General Manager has a degree in Chemical Engineering and the Laundry Manager has a Bachelor of Science degree. I own it. Degree in Laundry Technology. Technical workers, such as operators and tailors, may be less educated but receive on-the-job training to improve their skills to enhance their skills.
4. **Organizational Structure:** Laundries and laundry services have well-structured administrative hierarchies that establish the level of oversight, the number of employees, and the level of control accomplished at each level. Clearly defined communication channels and guidelines for monitoring and employment necessities ensure current coordination and control.

In summary, in-store laundry optimization must consider factors such as location and facility layout, organizational structure, employee credentials and training, and availability and maintenance of material resources and equipment. By considering these aspects, healthcare facilities can improve the efficiency, quality, and satisfaction of their laundry services. .

CONCLUSION:

In conclusion, the optimization of laundry in-source at Mission Hospital is crucial for maintaining sanitation, minimizing the spread of infections, and ensuring efficient linen management. Based on the information provided, the following key points can be highlighted:

1. **Implication of Laundry Services :** This study distinguishes the importance of hospital laundry services in maintaining hygiene and reducing the risk of infection. Proper handling and disposal of soiled or contaminated linen is crucial to protect patients, staff, and the hospital environment as a whole.
2. **Study on Laundry Operations:** The study conducted was aimed at understanding how hospitals conduct their laundry operations. It is important to identify areas that need upgrading and implement strategies to increase effectiveness and efficacy.
3. **Location and Facility Design:** Placing the laundry and laundry services department on the first floor with easy access to user areas such as emergency rooms and operating rooms allows for quick and competent laundry distribution. Nearness to other departments such as CSSD, Nutrition Services and Central Boiler house ensures smooth synchronization and resource utilization.
4. **Organizational Structure:** A well-structured organizational hierarchy, clear communication channels, and established policies regarding supervision and employment requirements contribute to effective supervision and control of laundry services. This keeps everything running smoothly and makes the decision-making process easier.
5. **Employee Qualifications and Job Satisfaction:** Qualification and training of laundry service personnel, including chief managers and staff, is essential for the department to function effectively and efficiently. Research results show links between job satisfaction and factors such as age, gender, tenure, salary levels, and opportunities for advancement. Understanding these factors can help improve employee engagement and satisfaction.
6. **Material Resources and Equipment:** Material resources, especially laundry, are very important to laundry operations. Proper inventory supervision and maintenance schedules for equipment such as dry-cleaning machines and airlock machines are compulsory to ensure smooth operations and quality service. Classifying equipment in need of replacement is critical to maintaining effectiveness and meeting the needs of the hospital environment.

To streamline the mission hospital's laundry process, it is important to contrivance best practices and strategies that offer multiple benefits.

1. **Installation of Reliable Dispensers:** Using a reliable dispenser for cleaning chemicals and detergents ensures precise and dependable dosing for better cleaning results. This allows you to maintain the quality and cleanliness of your laundry while minimalizing waste.
2. **Utilization of Smart Technology Platforms** - By executing intelligent technology platforms such as laundry management software and RFID systems, real-time insight into the laundry process can be guaranteed. This enables better inventory tracking, efficient workflow management and data-driven decision making.
3. **Process Mapping and Analysis:** Mapping and scrutinizing your current laundry process is essential for identifying opportunities for improvement and optimizing your workflow. By understanding your work flow and categorizing bottlenecks and inadequacies, you can rationalize processes and take appropriate actions to improve overall performance
4. **Managing Fluctuating Demand:** Laundry operations in healthcare facilities often face fluctuations in demand due to changing patient needs and significances. It is important to anticipate and adapt to these instabilities by implementing flexible scheduling, capacity planning, and resource allocation strategies. This helps you manage workload instabilities and ensure on-time delivery of clean linens.
5. **Environmental Sustainability:** Environmental sustainability should also be considered when optimizing the laundry process. By using energy-efficient machinery, implementing water-saving measures, and adopting environmentally friendly washing methods, laundry operations can minimize environmental waste and contribute to sustainability goals.

Optimizing mission hospital linen inventory provides several benefits, including increased productivity, accurate linen tracking, fewer errors and losses, increased customer satisfaction, and reliable real-time information. . Consider executing technologies such as RFID systems to automate processes and improve inventory management.

In conclusion, by considering the significance of laundry services, the facility design, organizational structure, employee qualifications and job satisfaction, and the management of material resources and equipment, Mission Hospital can optimize its laundry in-source, leading to improved hygiene standards, cost savings, and improved overall operational efficiency

SUGGESTION & RECOMMENDATION

Suggestion for executing a Ultra frequency-Radio frequency Identification system for managing hospital linen laundry is indeed a great innovation that can significantly improve the efficiency and accuracy of linen management. By using Radio frequency Identification gates and Ultra frequency tags, the proposed system can track and record the condition of linen throughout the laundry process. Here are some key points to consider:

1. **Monitoring and Web Application:** A primary computer and web application can be used to monitor the data and the status of the linen. This allows for real-time tracking, broadcasting, and analysis of linen inventory and usage.
2. **Database Update:** The server updates the database with the status of the linen, marking it as "Dirty linen" and correlating it with relevant information such as the patient or department.
3. **Data Broadcast:** When a quantity of dirty linen passes through the Radio frequency Identification gate, the tag information is read and systematized to the server through the local area network Local area Network.
4. **Supplementary Statuses:** The system can also track other statuses such as linen loss, damaged linen, and the number of washing life-cycles. These statistics can be stored in the database for further scrutiny and inventory management.
5. **Radio frequency Identification Tagging:** Each portion of linen is docketed with an Ultra Frequency -Radio frequency identification tag. The tag comprehends exceptional identification information that can be read by Radio frequency identification gates.
6. **Radio frequency Identification Gate Identification:** When the washed linen passes through the Radio frequency Identification gate again, the tag is read, and the system updates the database with the status of the linen, marking it as "Cleaned linen."

7. Hygienic Cleaning: The laundry facility executes the necessary cleaning and laundry procedures on the dirty linen before returning it to the hospital.

By implementing this Ultra Frequency- Radio frequency Identification based hospital linen laundry management system, the hospital can have better control and perceptibility over its linen inventory, reduce losses and indemnities, and ensure that clean and hygienic linen is provided to patients and departments. It also provides accurate data for management and optimizing laundry operations.

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