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"A STUDY ON STREAMLINING GARMENT PRODUCTION PROCESS USING CRITICAL PATH METHOD WITH SPECIAL REFERENCE IN TIRUPUR"

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ABSTRACT:

This study focuses on streamlining the garment production process utilizing the Critical Path Methodology (CPM). The primary objectives are to identify critical paths and activities, optimize production task sequences, allocate resources efficiently, and manage task dependencies to minimize project risks. The research design employs a quantitative approach, analyzing inventory management strategies in the apparel industry. Primary data sourced directly from the company is utilized, focusing on inventory levels, demand patterns, lead times, and cost implications. The analysis techniques involve the Critical Path Method and Gantt chart. The study period spans from January to March 2024.

Keywords: garment production, Critical Path Methodology, inventory management, operational efficiency, resource allocation, project risks.

INTRODUCTION:

The Critical Path Method (CPM) is a project management technique used in garment manufacture to improve efficiency and productivity. It identifies critical tasks, assesses their interdependence, and establishes a project completion timeline. In garment production, CPM divides the process into individual activities, assigning durations and establishing interdependence. A network diagram depicts the project flow and highlights the critical path. This enables managers to allocate resources more efficiently and track success effectively. CPM supports real-time adjustments and changes, enabling managers to make informed decisions based on market trends and client preferences. It also helps cross-functional teams communicate and collaborate more effectively, promoting accountability and teamwork. Regular progress updates and milestone reviews allow stakeholders to address concerns proactively and make course corrections, ensuring that the project remains.

OBJECTIVE OF THE STUDY:

- This project aims to streamline garment production processes using the Critical Path Methodology (CPM).
- It identifies critical activities, optimizes production sequence, optimizes resource allocation, and proactively manages potential delays and risks to minimize project duration and resource utilization.

SCOPE OF THE STUDY:

This study focuses on applying Critical Path Methodology (CPM) to optimize garment production processes, including design, sourcing, cutting, sewing, finishing, and quality assurance. It aims to explore how CPM principles can improve efficiency, minimize delays, and enhance overall productivity.

PROBLEM STATEMENT:

The study's limitations include inability to account for unforeseen garment production disruptions and not considering individual nuances of each facility, potentially causing applicability discrepancies across different contexts.

REVIEW OF LITERATURE:

Daniela B Nascimento et al. (2010) Determined lowest cost spreading and cutting schedule for garments of styles, colors and sizes, which were subjected to physical constraints like cutting, table length, cutting knife height and stock keeping unit.

Ali Hasanbeigi & Lynn Price (2012) Studied an energy use, energy efficient technologies, measures applicable for textile industries, introduced 184 energy efficient measures applicable, analyzed the type and share of energy used in textile industries around the world, also introduces various energy efficient improvement opportunities available within some of the major textile sub sector.

Murat Çokgezen (2009) studied the technical efficiencies of faculties of private and public institutions in Turkey, it was found that low overall efficiency with high variations across the faculties of commerce, the result also show that the average efficiency of public institutions was higher if the quality of data was not considered.

Sauwai You et al. (2009) studied the impact of textile industry onChina's environment using a quantitative framework, the study finds the negative impact of expanding textile industry on china's environment and suggested to address the problems associated with textile industry in China.

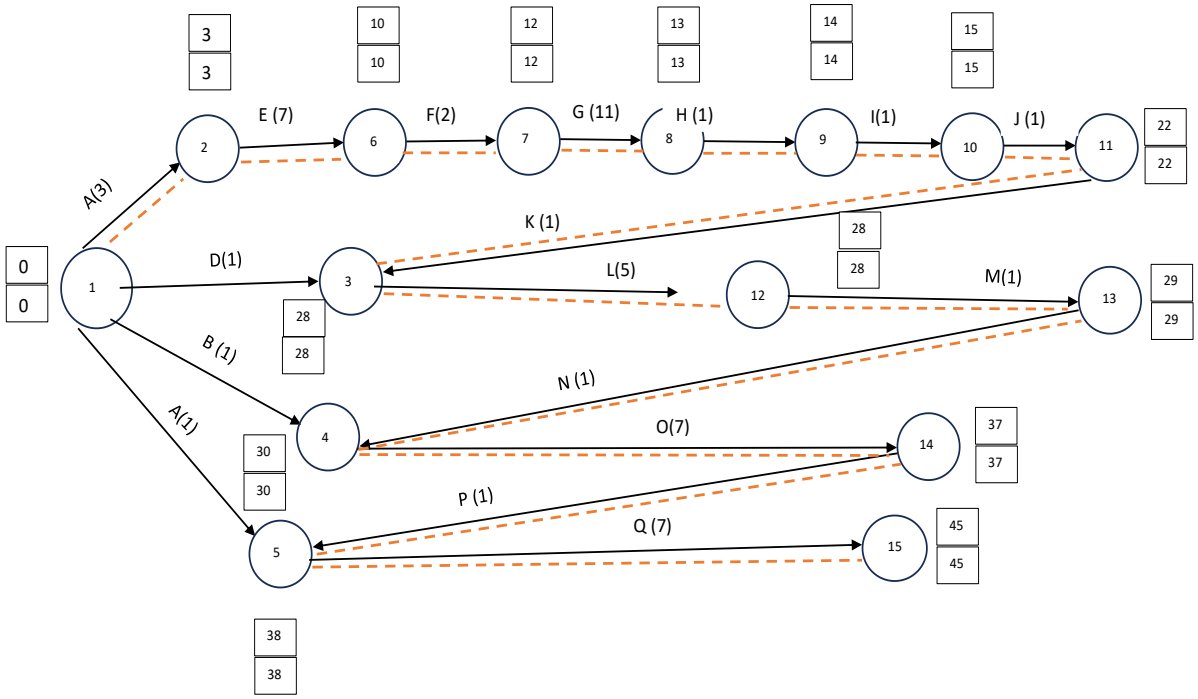
ANALYSIS AND INTERPRETATION:

CPM:

The Critical Path Method (CPM) is a project management technique used to plan and manage complex projects. It involves identifying the sequence of tasks that must be completed to accomplish the project, determining the duration of each task, and identifying the critical path—the longest sequence of dependent tasks that determines the minimum time required to complete the project.

ACITIVITY	PREDECESSORS	DURATION
Packing Material	-	1
Sewing Material	-	1
Yarn purchase	-	3
Designing process	-	1
Knitting program	C	7
Dying	E	2
Washing	F	1
Centring	G	1
Compacting	H	1
Cutting	I	7
Checking	J	1
Printing	D, K	5
Fusing	L	2
Checking	M	1
Sewing process	B, N	7

Final checking	O	1
Ironing and Packing	A, P	7



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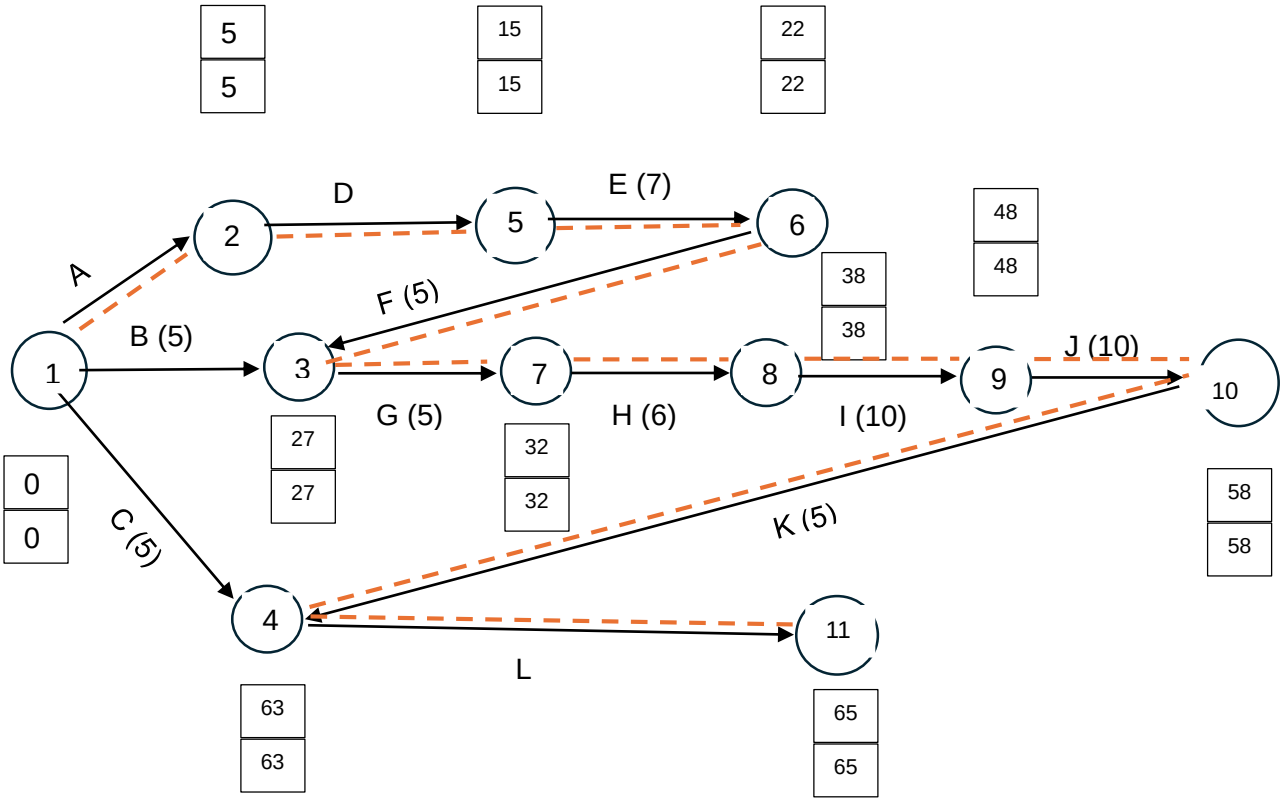
=45

INTERPRETATION:

The critical path is the longest path through a network, spanning 45 days. It helps project managers identify critical activities, allocate resources effectively, schedule and monitor progress, and manage potential risks. It helps identify activities like Yarn Purchase, Knitting Program, Cutting, Sewing Process, and Ironing and Packing, which directly impact project completion. By prioritizing these activities, managers can prevent delays and ensure the project's success.

ACITIVITY	PREDECESSORS	DURATION
Foam preparation	-	5
Label purchase	-	5
Button purchase	-	5
Coller preparation	A	10
collar Band	D	7
collar Attachment	E	5
Label Attaching	B, F	5
Shoulder seem	G	6
Side seem	H	10
Sleeve Attachment	I	10
Hemming	J	5
Button placket	C,K	2

5.4 Critical path diagram



=A+D+E+F+G+H+I+J+K+L

=5+10+7+5+5+6+10+10+5+2

=65

INTERPRETATION:

The critical path method is a network diagram that determines the longest path through a network, impacting the project's duration. It involves activities such as foam preparation, collar preparation, collar band, collar attachment, label attaching, shoulder seam, side seam, sleeve attachment, hemming, and button placket. This method helps identify critical activities, allocate resources efficiently, schedule tasks, manage risks, and communicate effectively with stakeholders. The critical path also aids in risk assessment, allowing proactive mitigation plans. Overall, the critical path method aids in planning, scheduling, allocating resources, managing risks, and communicating effectively with stakeholders, ultimately ensuring project completion within the desired timeframe.

FINDINGS:

The Critical Path Methodology and Gantt chart analysis are crucial tools for streamlining production processes. They help identify critical activities, optimize production flow, allocate resources efficiently, manage risks, and implement Gantt charts. By focusing on these activities, companies can reduce lead times, enhance productivity, and achieve operational excellence. Regular evaluation and improvement of these processes can lead to better performance and customer satisfaction. Overall, these methods contribute to a more efficient and effective production process.

SUGGESTION:

The garment production process involves identifying key tasks, creating a timeline, using software, prioritizing, communicating, allocating resources, monitoring progress, breaking down larger tasks, streamlining material sourcing, and implementing quality control measures. The CPM method helps identify critical paths and improves production time and quality.

CONCULSION:

The research demonstrates that the Construction Project Management (CPM) method is effective in managing construction contracts, improving schedule control, reducing costs, and enhancing project quality. It is more efficient and cost-effective than manual methods, reducing disruptions and delays, and ensuring customer satisfaction and timely delivery.

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