

Paper 19: Knowledge Management

MSLIS (2017-19) IV Semester

Date: 06/05/2019

Time : 3 hrs

Max Marks : 100

Any 5 questions out of 8 needs to be answered. Each question carries 20 marks each

Please read the case study information carefully. The questions are listed at the end.

### Match box manufacturing

A match is a tool for starting a fire. Typically, modern matches are made of small wooden sticks or stiff paper. One end is coated with a material that can be ignited by frictional heat generated by striking the match against a suitable surface. Wooden matches are packaged in matchboxes, and paper matches are partially cut into rows and stapled into matchbooks. The coated end of a match, known as the match "head", consists of a bead of active ingredients and binder; often coloured for easier inspection. There are two main types of matches: safety matches, which can be struck only against a specially prepared surface, and strike-anywhere matches, for which any suitably frictional surface can be used. Some match-like compositions, known as electric matches, are ignited electrically and do not make use of heat from friction.

Match box manufacturing is manual in nature. Bill of Materials (BOM) used in match box manufacturing includes:

- Outer cover which include striking surface (generally on 2 sides) and has branding details on one side and general / statutory information on the other
- Inner cover which includes space for holding the match sticks. Should be stiff enough to hold the match sticks and to easily move it into outer cover.
- Match sticks either of wood or of wax with a phosphorous head. In India, typically a match box holds 40 sticks in a box.

A stringent Quality Control process is adopted for all inward materials. As part of the vendor approval process, visit to the supplier facility to verify Good Manufacturing Practices (GMP) adoption, sufficient quality controls and compliance management is undertaken. The vendor is on boarded into the approved vendor list after suitable assessment.

Orders are placed on approved vendor. Vendors supply material based on orders issued. Once inward materials are received from the vendor, QC tests are done before approval of the lot and issue of materials. A sampling plan as per BIS 2500 standard is adopted.

A daily plan, schedules the number of match boxes that need to be assembled and despatched and is released by Production Planning and Control (PPC) department. Stores department issues the required material in the following ratio: Outer cover: Inner cover: match sticks – 1: 1: 40.

The assembly area layout facilitates cellular manufacturing. Totally 10 cells work at any point of time. Each cell has 5 members which carry out counting of match sticks, aligning sticks in one direction, stuffing match sticks into inner cover and finally assembling the inner cover into outer cover. A study by the Industrial Engineering department has set a standard of getting 30 boxes per hour per cell. Packing of 10 match boxes into a paper cover is the packing standard. Such 10 match box units amounting to 100 are packed into a carton box which is ready for despatch.

Randomly, cartons boxes are selected for final inspection. Sampling plan BIS 2500 is used.

During the assembly process, each cell maintains logs of the activities in a pre-determined format. Each cell is expected to update the logs on an hourly basis about the volume of match boxes assembled. The QC department keeps a log of all the tests carried out both during the in-warding of materials and also during the final inspection. Stores department keeps stock book of all materials in-warded and material issued.

Here are typical logs of match box assembly:

**Daily Assembly Log**

Date of assembly	05-Apr-2017	Cell ID	03
Time	# of members present	Count of match boxes assembled	Remarks
9.00 AM – 10.00 AM	5	18	
10.00 AM – 11.00 AM	5	28	
11.00 AM – 12.00 PM	5	22	10 mins tea break
12.00 PM – 1.00 PM	5	29	
1.00 PM – 2.00 PM	0	0	Lunch break
2.00 PM – 3.00 PM	4	24	1 Sick leave
3.00 PM – 4.00 PM	4	27	
4.00 PM – 5.00 PM	4	25	
5.00 PM – 6.00 PM	4	22	Shortage of sticks
<b>Total person hours</b>	36	<b>Total match boxes assembled</b>	199

**Daily Assembly Log**

Date of assembly	05-Apr-2017	Cell ID	07
Time	# of members present	Count of match boxes assembled	Remarks
9.00 AM – 10.00 AM	5	16	
10.00 AM – 11.00 AM	5	29	
11.00 AM – 12.00 PM	5	24	10 mins tea break
12.00 PM – 1.00 PM	5	30	
1.00 PM – 2.00 PM	0	0	Lunch break
2.00 PM – 3.00 PM	5	20	
3.00 PM – 4.00 PM	5	22	
4.00 PM – 5.00 PM	5	21	
5.00 PM – 6.00 PM	5	22	
<b>Total person hours</b>	40	<b>Total match boxes assembled</b>	184

**Daily Assembly Log**

Date of assembly	06-Apr-2017	Cell ID	03
Time	# of members present	Count of match boxes assembled	Remarks
9.00 AM – 10.00 AM	5	22	
10.00 AM – 11.00 AM	5	29	
11.00 AM – 12.00 PM	5	24	10 mins tea break
12.00 PM – 1.00 PM	5	28	
1.00 PM – 2.00 PM	0	0	Lunch break
2.00 PM – 3.00 PM	5	26	
3.00 PM – 4.00 PM	5	28	
4.00 PM – 5.00 PM	4	26	
5.00 PM – 6.00 PM	4	24	1 Sick leave
<b>Total person hours</b>	38	<b>Total match boxes assembled</b>	207

**Daily Assembly Log**

Date of assembly	07-Apr-2017	Cell ID	07
Time	# of members present	Count of match boxes assembled	Remarks
9.00 AM – 10.00 AM	5	19	
10.00 AM – 11.00 AM	5	30	
11.00 AM – 12.00 PM	5	25	10 mins tea break
12.00 PM – 1.00 PM	5	28	
1.00 PM – 2.00 PM	0	0	Lunch break
2.00 PM – 3.00 PM	5	23	
3.00 PM – 4.00 PM	5	21	
4.00 PM – 5.00 PM	5	20	
5.00 PM – 6.00 PM	5	19	Shortage of sticks
<b>Total person hours</b>	40	<b>Total match boxes assembled</b>	185

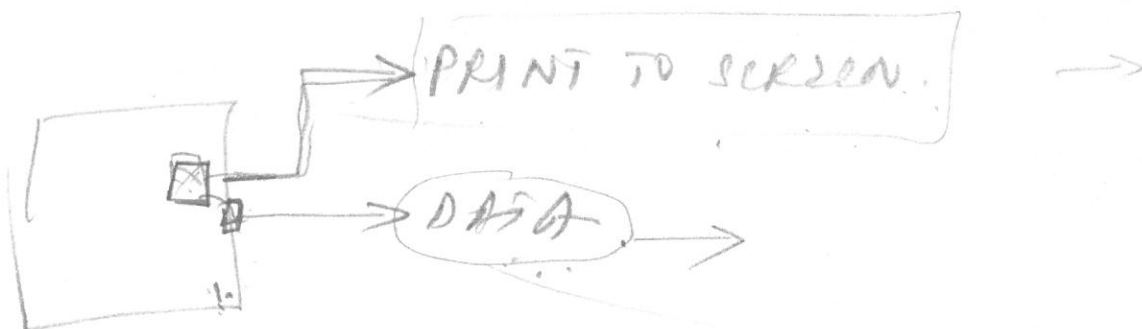
The company does a lot of analysis on the data captured. Typical Key performance indicators (KPI) being monitored are:

1. Total match boxes produced for the day by individual cells
2. Hourly Productivity = Count of match boxes assembled / # of resources hours available
3. Daily Productivity = Total match boxes assembled for the day / # of resource hours available

4. Hourly % Variance = Count of match boxes assembled / 30 \* 100

Answer any 5 questions:

1. Define a KM strategy including People / Roles, Process and Technology for the Organization and identify sources of Knowledge
2. Document a Step by Step instruction / Standard Operating Procedure for the assembly employees to ensure standardization amongst cells
3. Being conscious about the employees being illiterate / basic literate, how will you define standards?
4. Please calculate the 4 KPIs defined for the data provided
5. Define visualization charts for depicting the 4 KPIs and describe briefly why you are selecting a particular chart (Bar charts, Pie charts, etc)
6. Can you describe how PDCA cycle be used for improvement in performance of the assembly process?
7. How would you describe Human capital of the Organization?
8. How would you use technology to automate measurement and display of KPIs onto the Web / Mobile device?



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