

Essentiality of MIS in Data Analytics & Cloud Computing for Sustainable Revolution of Bangladesh RMG Industry Through Production Monitoring

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Abstract

Data collection and recording are worthless for an industry if they don't bring benefit. Management information system (MIS) is essential in transforming data into information and make intelligent business solutions. In the Ready-made garments (RMG) industry of Bangladesh, production monitoring, performance evaluation and improvement initiatives are key driving approaches for sustainable development. Industries are tended to monitor production in traditional way of day-to-day paper-based approach which can't help for future data analysis due to lack of proper cloud-based MIS. The study is on the essentiality of MIS in data analysis and cloud computing to transform a traditional excel based information system into a cloud-based system for monitoring production and improve performance. Here, data are obtained from a RMG industry and an excel based framework is described which is proposed for transforming to cloud-based MIS system. During the work, a structured formats and steps are established for hourly, daily, monthly and yearly data recording. Such transformation to computer and mobile based computing MIS system will help to overcome the difficulty of traditional approach and to transform data into information. This will help industries in performance improvement and evaluation and such system is widely applicable for any time of industry.

Keywords-

Management Information System, Cloud Computing, Production Monitoring.

1. Introduction

Ready Made Garments (RMG) sector has emerged as the biggest earner of foreign currency, contributing significantly to the GDP and providing large employment. In apparel manufacturing industries, it is must to monitor the production to trace the issues in each and every minute and to solve it before damage done for the whole day and business. To have a better control, most of the companies are monitoring hourly production in several ways making several repeated reports, using more resources with time causing a good amount of cost involvement also. The problem in Ready-made garments industry in Bangladesh is data monitoring and recording in this sector is mostly traditional paper based. This is not giving benefit of MIS to the business.

1.1 Objectives

The objective of the study is establishing a structured formats and steps for hourly, daily, monthly and yearly data record and an excel based system is described here which is proposed for transforming to cloud-based system. Aim is

to present the essentiality of MIS in data analysis and cloud computing to transform a traditional excel based information system into a cloud-based system for monitoring production and improve performance.

2. Literature Review

Chen (2016) mentioned that, the apparel industry must strengthen the use of computer technology and information. The importance of information in the decision-making processes, as its importance is related to the spotting of opportunities and to the best business management. Laudon (2000) mentioned that, management information systems are only computer-based systems which performs middle management’s control and decision making by offering routine reports from operation level actions performed and deviations to production plan. Somani and Anukriti (2010) described that, the MIS solutions include all the area of decision support systems to information systems that are linked to business and organization. A Management Information System (MIS) can function significantly in garment factories for information storage, handling, processing and retrieval of data. The MIS will also facilitate quick decision making for overall functional improvement.

3. Methodology & Data Collection

The methodology of the study is MS Excel based formatting of production monitoring of a manufacturing system which is later proposed for the MIS implementation based on data analytics and cloud computing. A structured formats and steps are established for hourly, daily, monthly and yearly data record. Here, data are obtained from a RMG industry and an excel based system is described which is proposed for transforming to cloud-based system.

4. Production Monitoring & MIS Implementation

As production monitoring is the most effective weapon for production controlling, all garment industries have the same common practice, though majority of garments industries are not utilizing these data effectively because of modernized management information system. Only hourly production data capturing can give huge information in short term and long term for the company based on which company can improve more. Below are the steps for how production hourly data capturing can provide information to hourly, daily, monthly, yearly and even more.

- Step 1: Capture production data (hourly line wise)
 - Step 2: Data entry (information storage)
 - Step 3: Information storage and processing
 - Step 4: Hourly line wise production status & Graphical Trend
 - Step 5: Daily production, plan vs. actual, efficiency status
 - Step 6: Monthly production, plan vs. actual, efficiency, changeover performance, line performance.
 - Step 7: Yearly production, plan vs. actual, efficiency, changeover performance, line performance.
- These will give a clear picture for people’s evaluation.

4.1 Production Data Capturing

Hourly production data were collected from production lines. Day’s line wise buyer, build-up plan, today’s plan, working hour were entered. Below is the data from a company as an example.

2016		1-Dec			HOURLY Production Capturing Sheet													
Line	Buyer	SMV	MP	Build-Up	Plan Target	WH	Hourly Target	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
Line A	JCP	16.80	68	1200	1000	10	100	80	80	90	90	100	110	100	110	120	120	
Line B	Hagger	24.08	65	1300	600	10	60	40	40	40	50	50	60	60	50	50	60	
Line C	Levi's	24.49	77	1300	1400	10	140	120	140	140	140	140	140	140	140	150	150	
Line D	Uniqlo	30.11	80	1200	1000	10	100	70	80	90	100	90	100	80	90	100	100	
Line E	M&S	24.39	73	1150	1200	10	120	110	110	120	120	120	120	120	120	130	130	
Hourly Total				6150	5200		520	420	450	480	500	500	520	520	500	540	560	

Figure 1: Hourly Production Capturing Sheet

4.2 Data Entry

Captured data were entered into the system for processing to get the information from data. This has done in Excel system. It is proposed to develop in a software or application so that there will be defined option for entry and also for output status, trends etc.

Data Entry & Processing											
LINE	1-Dec	3-Dec	4-Dec	-	25-Dec	26-Dec	27-Dec	28-Dec	29-Dec	31-Dec	
A	Plan Target	1000	600	700		1400	1400	1400	1400	1400	
	Target Eff%	41%	36%	42%		55%	54%	54%	54%	54%	
	Achieved	1000	200	700		1,050	1,200	1250	1300	1250	
	Achieved Eff%	41%	12%	42%		41%	46%	48%	50%	48%	
	Running Days	7th	1st	2nd		8th	9th	10th	11th	12th	
	SMV	16.8	24.45	24.45		16.73	16.73	16.73	16.73	16.73	
	MP	68	68	68		71	72	72	72	72	
WH	10	10	10		10	10	10	10	10		

Figure 2: Data Entry & Processing

4.3 Information Storage & Processing

After processing, data were stored properly for monthly, yearly and even for more long time for processing to provide information. Below are the data for few days and same way all daily data need to keep with proper entry.

Monthly Production Summary								
LINE	1-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	TOTAL	
A	Plan Target	1000	600	700	900	1000	27800	
	Target Eff%	41%	36%	42%	52%	58%	51%	
	Achieved	1000	200	700	820	900	25033	
	Achieved Eff%	41%	12%	42%	48%	52%	46%	
	+/-	0	-400	0	-80	-100	-2767	
	Running Days	7th	1st	2nd	3rd	4th	5th	
	SMV	16.8	24.45	24.45	24.45	24.45	20.13	
	MP	68	68	68	70	70	70.28	
WH	10	10	10	10	10	10.0		

Figure 3: Information Storage & Processing

4.4 Information Retrieval

After processing, data will give information of status of production and trends. Management can find issues in sources to solve, update, improve, modify etc.

A. Hourly Status

- Hourly line wise production status

2016	1-Dec			HOURLY Production Monitoring													
Line	Buyer	SMV	MP	Build-Up	Plan Target	WH	Hourly Target	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Line A	JCP	16.80	68	1200	1000	10	100	80	80	90	90	100	110	100	110	120	120
Line B	Hagger	24.08	65	1300	600	10	60	40	40	40	50	50	60	60	50	50	60
Line C	Levi's	24.49	77	1300	1400	10	140	120	140	140	140	140	140	140	140	150	150
Line D	Uniqlo	30.11	80	1200	1000	10	100	70	80	90	100	90	90	100	80	90	100
Line E	M&S	24.39	73	1150	1200	10	120	110	110	120	120	120	120	120	120	130	130
Hourly Total				6150	5200		520	420	450	480	500	500	520	520	500	540	560

Figure 4: Hourly Production Monitoring Sheet

- Graphical presentation of production trends

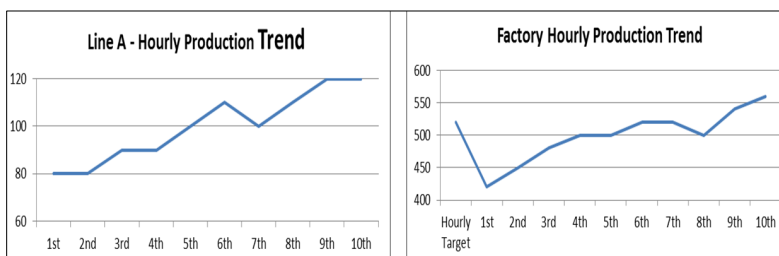


Figure 5: Hourly Production Trend (Line wise & All)

B. Daily Status

- Day's line wise production chart

2016	1-Dec			DAILY Production Status																
Line	Buyer	SMV	MP	Build-Up	Plan Target	WH	Hourly Target	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	TOTAL	+/-	Eff%
Line A	JCP	16.80	68	1200	1000	10	100	80	80	90	90	100	110	100	110	120	120	1000	-200	41%
Line B	Hagger	24.08	65	1300	600	10	60	40	40	40	50	50	60	60	50	50	60	500	-800	31%
Line C	Levi's	24.49	77	1300	1400	10	140	120	140	140	140	140	140	140	140	150	150	1400	100	74%
Line D	Uniqlo	30.11	80	1200	1000	10	100	70	80	90	100	90	90	100	80	90	100	890	-310	56%
Line E	M&S	24.39	73	1150	1200	10	120	110	110	120	120	120	120	120	120	130	130	1200	50	67%
Hourly Total				6150	5200		520	420	450	480	500	500	520	520	500	540	560	4990	-1160	54%

Figure 6: Daily Line wise Production Status

- Day's Line Production & Plan vs. Actual Graph

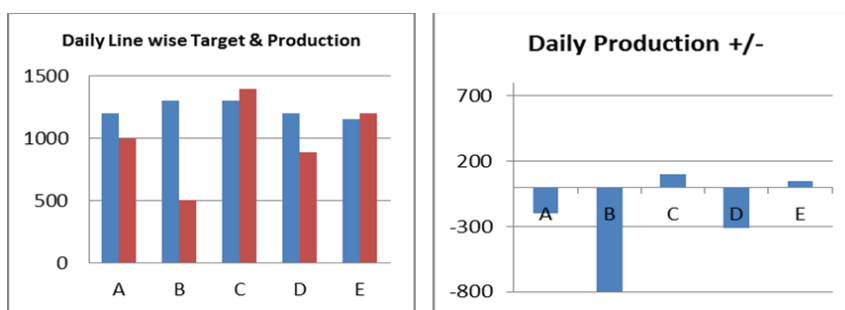


Figure 7: Daily Line wise Production Status

- Day's line wise efficiency chart

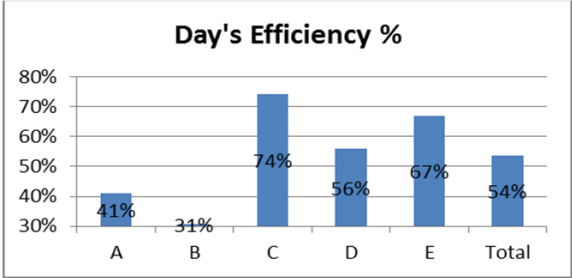


Figure 8: Daily Line wise Efficiency Status

C. Monthly Status

- Month's line wise production chart



Figure 9: Month's line wise production chart

- Month's Plan vs. Actual / Line Performance

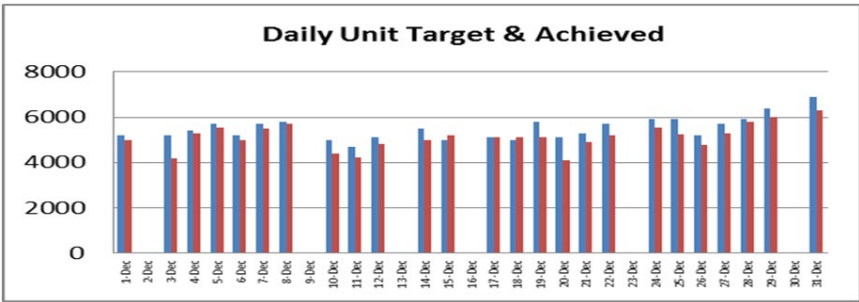


Figure 10: Monthly Target vs. Achieved

- Month's Production Losses

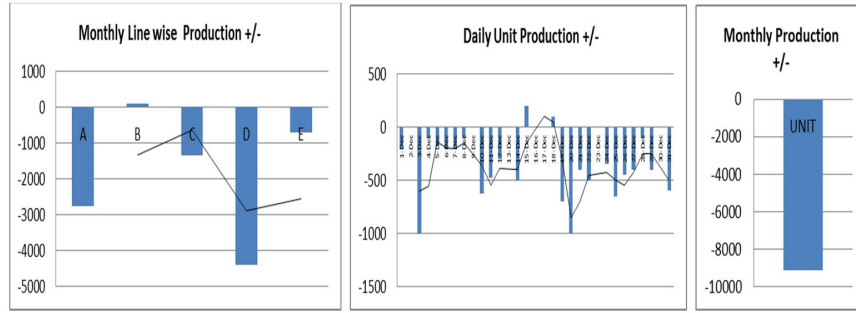


Figure 11: Monthly Production Losses

- Month's line wise efficiency chart

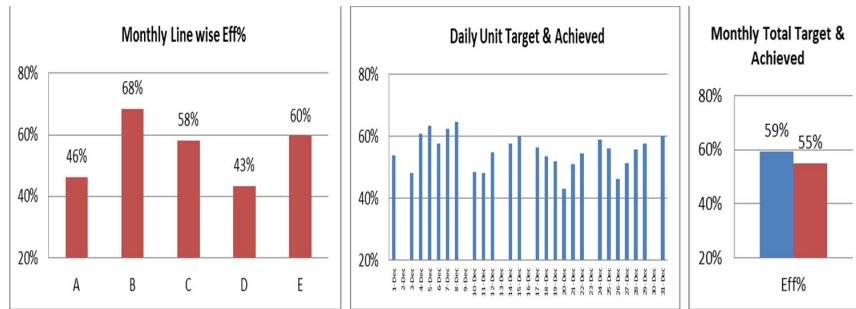


Figure 12: Monthly Line wise Eff% & Target vs. Achieve

- Month's Changeover status graph

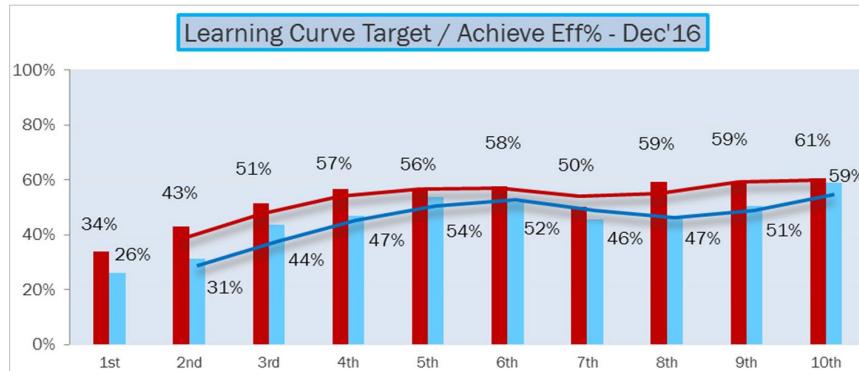


Figure 13: Monthly Changeover Learning Curve

LINE	Tgt / Eff%	DAYS									
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
A	Target	1000	600	700	900	1000	1000	1000	1000	1000	1000
	Target Eff%	41%	36%	42%	52%	58%	58%	58%	58%	58%	58%
	Achieved	1000	200	700	820	900	900	900	700	700	1100
	Achieved Eff%	41%	12%	42%	48%	52%	52%	52%	41%	41%	64%
	Target	600	1000	1300	1200	1300	1400	1400	1400	1400	1400
	Target Eff%	25%	40%	51%	47%	51%	55%	55%	55%	54%	54%
D	Achieved	600	1103	1300	800	1260	1300	1350	1050	1200	1250
	Achieved Eff%	25%	45%	51%	31%	49%	51%	53%	41%	46%	48%
	Target	500	800	1000	1000	1000	1100	1200	1200	1200	1300
E	Target Eff%	29%	47%	59%	59%	57%	61%	64%	64%	64%	70%
	Achieved	448	500	700	900	1000	1100	1200	1200	1200	1200
	Achieved Eff%	26%	29%	41%	53%	57%	61%	64%	64%	64%	64%
	Target	500	700	800	1000	800	1000	400			
	Target Eff%	32%	45%	50%	63%	50%	63%	25%			
	Achieved	280	575	700	800	900	1000	400			
F	Achieved Eff%	18%	37%	44%	50%	56%	63%	25%			
	Target	800	800	700	700	700	800	800	1000		
	Target Eff%	53%	53%	46%	46%	47%	50%	48%	60%		
	Achieved	200	200	340	400	500	500	550	700		
	Achieved Eff%	13%	13%	22%	26%	34%	31%	33%	42%		
	Target	600	800	1000	1200	1200					
F	Target Eff%	37%	49%	61%	73%	73%					
	Achieved	600	800	1000	1200	1200					
	Achieved Eff%	37%	49%	61%	73%	73%					
	Target	500	800								
	Target Eff%	20%	32%								
	Achieved	603	850								
Summary	Achieved Eff%	24%	34%								
	Target Eff%	34%	43%	51%	57%	56%	58%	50%	59%	59%	61%
Summary	Achieved Eff%	26%	31%	44%	47%	54%	52%	46%	47%	51%	59%
	Learning Curve Pilocy	30%	45%	60%	70%	75%	75%	75%	75%	75%	60%

Figure 14: Monthly Changeover Learning Curve Data

- D. Yearly Status
- Year’s Plan vs. Actual / Line Performance
 - Year’s line wise efficiency chart
 - Yearly’s Changeover status graph

All monthly data will provide yearly data and similarly yearly status and performance status will generate.

4.5 Information Notification

Above were generated using Excel formulations. In next, this is proposed to develop into a computer or mobile app software or application so that notification can be sent to all users for above mentioned status update that will help more to the monitoring, control, performance justification and evaluation. According to the objective of this study, an excel based structured information system has been established for data collection, reporting and monitoring of production status. A software-based system to get information for performance evaluation and initiate improvement is proposed through this study.

5. Results and Findings

As this study is on establishing an Excel based framework, it is established above and the result obtained here is industry has easily started to identify the improvements areas, underperforming areas based on the daily, monthly and yearly data record and information. It helped industry to find the actual problem, do the correct evaluation, take steps on improvement. Later, this is proposed for a MIS based cloud computing system for automation of the system.

6. Discussion and Conclusion

6.1 Discussion

In this work, it is identified that, industry is having improper data records and collection process. For initial improvement, Excel based data collection and monitoring is system is established. Once this is maintained for months,

years, companies started to get benefit of identifying problems and improvements areas. It helped on taking decision in short time and correctly. As Excel based system is established, a MIS based system is proposed for implementation.

6.2 Conclusion

RMG the key driving sector for the economy and management information system can make it more analytic, updated, and informative to make more and more growth in this sector. It will cause less resource utilization and reiterative activities. More concentration will make it more and more developed. As Excel based system is established and MIS based system is proposed as this is established and industry started to get benefit on decision making and improvement initiatives. This type MIS system is widely applicable for any type industry.

6.3 Limitations and Future Scopes

Due to short time this research work is limited to excel based management information system. A software and cloud databased in-formation system is proposed for implementation. Later after few years, company initiated the MIS based tracking system and reports are generating from the system and it is under progress.

6.4 Acknowledgment

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Biography

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