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# Management Information System for Milling Section at Sugar Factory

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***Abstract:*** ***One of the most important goals in any organization is increasing work force productivity Information systems, Systems are the responsibility of their data and their processing of information within the organization and managers to provide information on important economic decisions making. Hutatma Sahakari Sakhar Karakhana. Ltd. is well known sugar industry having 5000 tccpd to 6000 tccpd capability along with new constructed new ethanol plant and using different facility in this factory such as leveller, fibrizor, kicker, TRPS rolling mill, elevator, boiler, pan and centrifuge. Management Information System (MIS) in increasing human resource productivity. Savings in labor, increased consumer surplus, improved customer service quality, improved organizational efficiency, quicker response to customers, deeper knowledge and understanding of customers. The purpose of this Project is to surveying the effect of management information system of productivity and its elements such as work speed, work cost, work accuracy (efficiency) and supervision and control status improvement, planning status improvement and make decision status improvement (effectiveness) of overall machine, man and material to improve performance of all over machinery, information systems.***

## I. INTRODUCTION

One of the most important goals in any organization is increasing work force productivity Information systems, systems are the responsibility of their data and their processing of information within the organization and managers to provide information on important economic decisions making. Hutatma Sahakari Sakhar Karakhana.Ltd. Is well known sugar industry having 5000 tccpd to 6000 tccpd capability along with new constructed new ethanol plant and using different facility in this factory such as leveller, fibrizor, kicker, TRPS rolling mill, elevator, boiler, pan and centrifuge. Savings in labor, increased consumer surplus, improved customer service quality, improved organizational efficiency, quicker response to customers, deeper knowledge and understanding of customers. The purpose of this paper is to surveying the effect of management information system of productivity and its elements such as work speed, work cost, work accuracy (efficiency) and supervision and control status improvement, planning status improvement and make decision status improvement (effectiveness) of overall machine, man and material to improve performance of all over machinery,Information systems. Sponsored organization faces problem in milling section such as Overloading of Feeding and Milling Equipment, Jams and Choking in Cane Feeding and Milling Equipment, continuous operation, failure of bearings, stopping the mill, more noise generation and leakages due to improper planning, measuring, recording, controlling, directing in the factory mill. This organization was working traditional manual operating milling machine. There was no provision for collection of data related to all

## II. MILLING SYSTEM USED IN SUGAR FACTORY

Juice extraction by milling is the process of squeezing the juice from the cane under a set mills using high pressure between heavy iron rollers. This mills consist of 3 to 6 rolls; every set of mills is called as tandem mill or mill train. For improve the milling extraction efficiency, imbibition water is added at each mill: Hot water is poured over the cane just before it enters the last mill in the milling train and is recirculate to the the first mill. The juice squeezed from this cane is low in sugar concentration and is pumped to the preceding mill and poured on the cane just before it enters the rollers, the juice from this mill is the same way pumped back up the milling train. Mixed juice (that is to say cane juice mixed with the water introduced at the last mill) is withdrawn from the first and second mills and is sent for further processing. Milling trains typically have four, five or six mills in the tandem. For improve the milling extraction performance before the cane reach the first mill, normally are used knife and shredder as preparation equipment.

 

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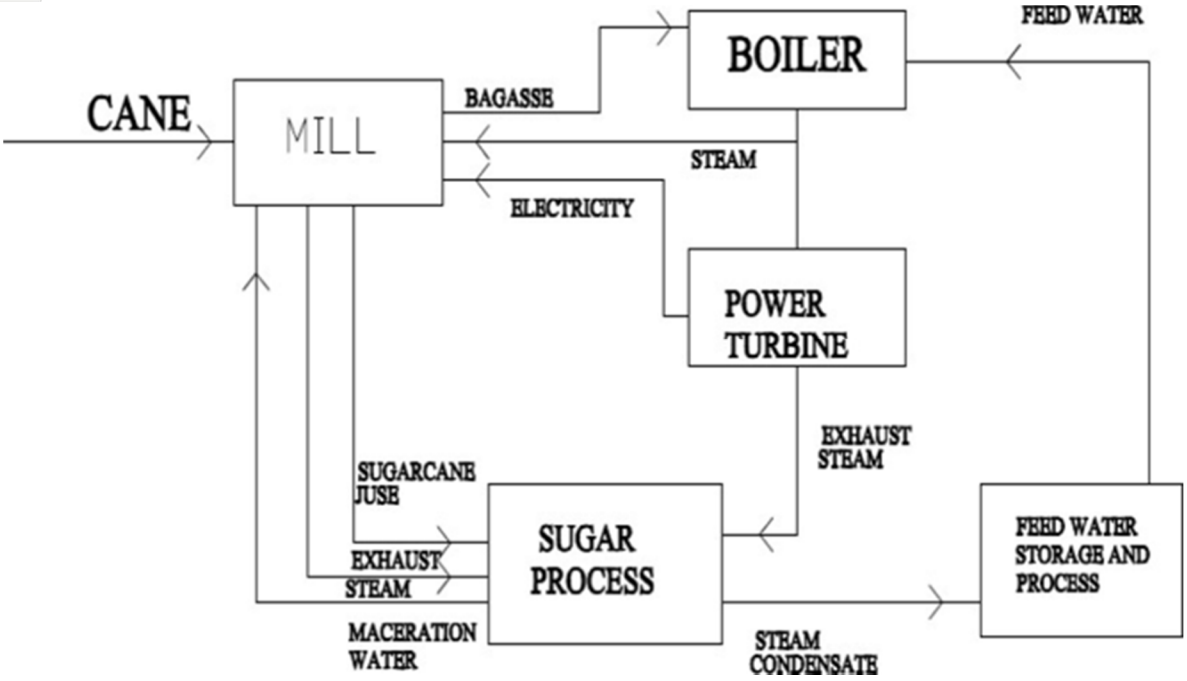


Fig.1 sugar factory layout( Turbine mill Drives)

## III. THERE ARE FIVE TYPES OF MILLS USED IN THIS ORGANIZATION.

Table No.1.:- Following table shows the specification of milling machine

| Contents | M zero | M I | M II | M III | M IV |
|---|---|---|---|---|---|
| Roller size in mm | 1000 | 890 | 805 | 805 | 890 |
| Roller length | 1800 | 1700 | 1524 | 1524 | 1700 |
| No of pitch of v groove | 30 | 30 | 30 | 18 | 18 |
| | 60 | 50 | 70 | 75 | 75 |
| Speed of roller in rpm | 4 | 4 | 5 | 5 | 4 |
| Total hydraulic pressure in kg/cm² | 150 | 175 | 175 | 175 | 175 |
| Hydraulic load M.T | 220.5 | 346.3 | 254.3 | 254.3 | 254.3 |
| Hydraulic load M.T/min | 375 | 203.3 | 169.5 | 169.5 | 169.5 |

## IV. MIS SYSTEM IMPLEMENTED IN MILLING PLANT

The control system scheme for the milling plant section is shown in Figure and briefly describes on the following paragraphs. The load current of the cane leveler, cane knives and ungarter indicates of the amount of cane being fed in the mill. The level of the cane chute of the first mill controls the speed of the feed conveyors. In case the level of the cane exceeds a present high level, then the speed of the conveyors is reduced and vice versa. By controlling the level of the first cane chute, the mill functions properly resulting in a constant flow material to the nest mills. In these mills, the levels of cane chute adjusts automatically as long as the general crushing rate control is active and the speed of all mills are controlled accordingly. It is not advisable to control the level of the cane chute by changing the speed of the mill, as the response time is low on account of the high inertia of the mills. Thus, the speed of the mills depends only on the set-point cane-crushing rate. The cane carrier has a set speed ratio from one to the other to ensure uniform feed/load to all the mills. The flow of the imbibition water is controlled to maintain raw juice of constant brix at the output of the milling plant section. The brix measurement provided before the inlet to the raw juice scale assists in automatic control of imbibition water flow as there is considerable time delay between the cane feed to the instant it reaches the last but one mill. The automation control concept described ensures constant flow of raw juice out of the mill section as also raw juice of constant brix. This ensures efficient performance of the succeeding section namely the clarification and the evaporator sections.

 

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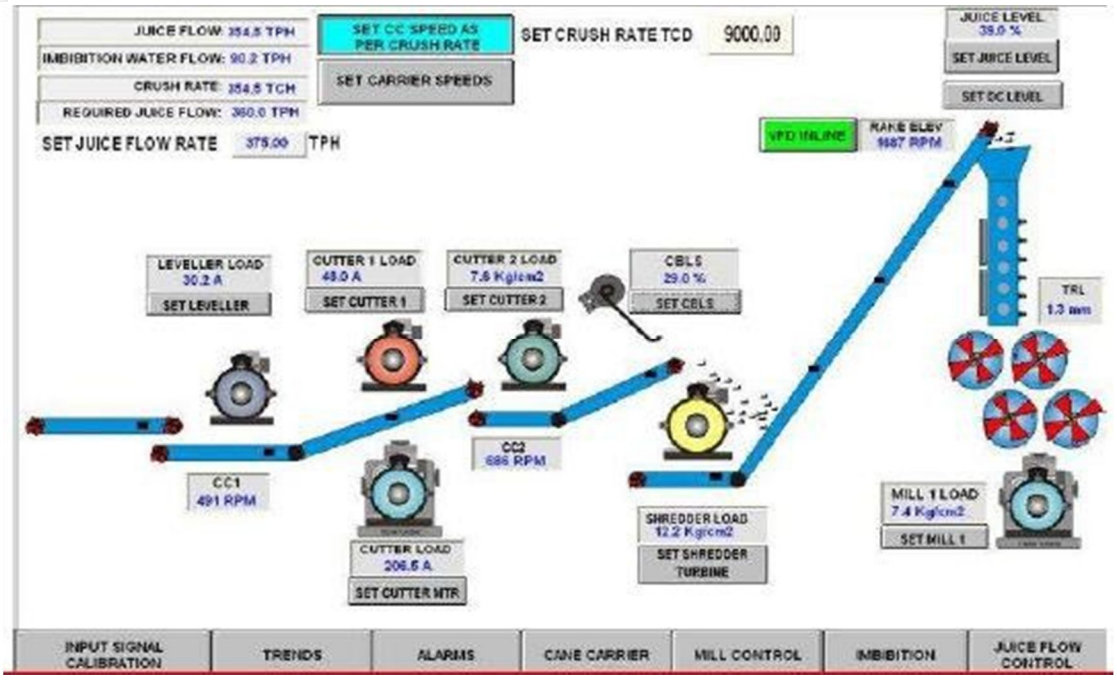


Figure 2. shows the Proposed System Configuration for Milling Plant Section.

## V. RESULTS AND ANALYSIS

This point contains comparison of failure of bearings without MIS System and with help of the MIS System. This result shows that rate of failure of bearing decreases to zero and increases juice flow rate , Bagasse % Pol and Bagasse Moisture when we implement MIS System.

Table 2. TCH result before implementation system

| Sr.no | Observation Day 1 | Observation Day 2 | Observation Day 3 | Observation Day 4 |
|---|---|---|---|---|
| 1 | 194 | 177 | 203 | 180 |
| 2 | 166 | 188 | 189 | 186 |
| 3 | 177 | 180 | 166 | 177 |
| 4 | 188 | 193 | 214 | 198 |
| 5 | 180 | 202 | 207 | 203 |

Table 3. TCH result After implementation system

| Sr.no | Observation Day 1 | Observation Day 2 | Observation Day 3 | Observation Day 4 |
|---|---|---|---|---|
| 1 | 211 | 226 | 243 | 255 |
| 2 | 233 | 243 | 228 | 226 |
| 3 | 245 | 235 | 244 | 201 |
| 4 | 260 | 209 | 211 | 226 |
| 5 | 233 | 216 | 233 | 264 |
| 6 | 220 | 236 | 245 | 255 |

Table 4. Bagasse % Pol result before implementation system

| Sr.no | Observation Day 1 | Observation Day 2 | Observation Day 3 | Observation Day 4 |
|---|---|---|---|---|
| 1 | 1.86 | 1.74 | 1.85 | 1.85 |
| 2 | 1.84 | 1.75 | 1.85 | 1.74 |
| 3 | 1.84 | 1.75 | 1.74 | 1.74 |
| 4 | 1.75 | 1.85 | 1.74 | 1.85 |
| 5 | 1.74 | 1.85 | 1.74 | 1.75 |
| 6 | 1.76 | 1.73 | 1.81 | 1.76 |

Table 5. Bagasse % pol result after implementation system

| Sr.no | Observation Day 1 | Observation Day 2 | Observation Day 3 | Observation Day 4 |
|---|---|---|---|---|
| 1 | 2.04 | 2.04 | 2.02 | 2.05 |
| 2 | 2.04 | 2.04 | 2.03 | 2.04 |
| 3 | 2.06 | 2.02 | 2.04 | 2.02 |
| 4 | 2.05 | 2.02 | 2.06 | 2.03 |
| 5 | 2.07 | 2.03 | 2.09 | 2.04 |
| 6 | 2.04 | 2.09 | 2.01 | 2.06 |

Table 6. Bagasse Moisture Result Before Implementation System

| Sr.no | Observation Day 1 | Observation Day 2 | Observation Day 3 | Observation Day 4 |
|---|---|---|---|---|
| 1 | 51.67 | 51.89 | 51.76 | 51.76 |
| 2 | 51.23 | 51.83 | 51.67 | 51.67 |
| 3 | 51.44 | 51.76 | 51.23 | 51.23 |
| 4 | 51.56 | 51.67 | 51.44 | 51.44 |
| 5 | 51.95 | 51.23 | 51.56 | 51.46 |
| 6 | 51.66 | 51.23 | 51.46 | 51.55 |

Table 7. Bagasse moisture result after implementation system

| Sr.no | Observation Day 1 | Observation Day 2 | Observation Day 3 | Observation Day 4 |
|---|---|---|---|---|
| 1 | 47.73 | 47.72 | 47.68 | 47.88 |
| 2 | 47.18 | 47.8 | 47.85 | 47.35 |
| 3 | 47.21 | 47.66 | 47.11 | 47.46 |
| 4 | 47.22 | 47.86 | 47.85 | 47.29 |
| 5 | 47.89 | 47.55 | 47.79 | 47.36 |
| 6 | 47.62 | 47.96 | 47.26 | 47.82 |

## VI. CONCLUSIONS

In this way, we implement MIS system into the sugar factory in sugar milling department. Where manual operating of mill is replaced by MIS system. All component are connected with sensing unit which gives continuous vigilance on the condition of different unit. If value of any component goes above the predetermined level, the alarm will be generated. Software gives continuous information of working condition of different unit. Which gives the Safety of the Cane Feeding and Milling Equipment and Prevention of Overloading of Feeding and Milling Equipment , Prevention of bearing failures Prevention of Jams and Choking in Cane Feeding and Milling Equipment., facilitate continuous operation. Reduction and Possible Elimination of Stoppages due to Human Error. Maintaining optimum load on the Preparatory Devices and Mills.

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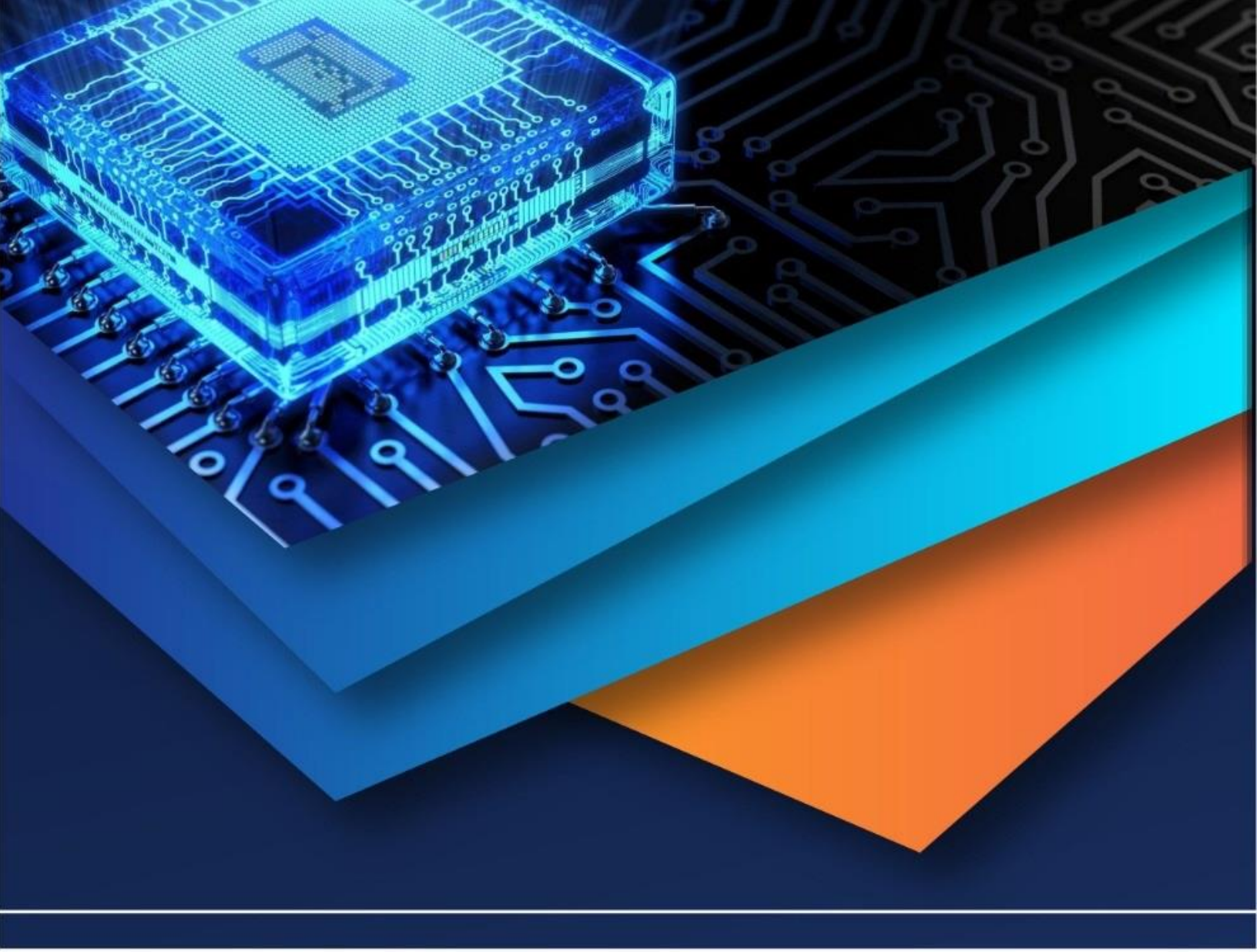

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