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“A Critical Analysis on the Effect of Synchronous Index in a typical Manufacturing sector using Synchronous Analyzer. “

Authors:

Mr. Ashok Mehatha

Asst Professor Dept of Industrial Engineering
Sri Siddhartha Institute of Technology, Tumkur India
+91-816-6532377, Email: a_mehatha@yahoo.co.in

&

Dr. B Ravishankar

Asst Professor Dept of Industrial Engineering
BMS College of Engineering, Bangalore India
+91-80-26622130 ext. 4032, Email: ravi36@gmail.com

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Abstract:

In any Industrial setup manufacturing department is a hub of all coordinating departments. Many Researchers/ Business process Analysts do emphasize to Plan, Schedule and Coordinate these manufacturing activities in an orderly manner to achieve high productivity. The process delays are normally handled with low priority and can lead to substantial loss to the industry. In this context Production Planning & Control is significant & has high risk while scheduling any process. This is a result of the uncertainty that may arise after scheduling any process with few vital resources of the industry. The executives are normally engrossed in routine exercises and don't track the synchronization of the process being scheduled. Knowledge on the Synchronous index of their own process can help them in designing effective strategies of their processes. Here an attempt is made to analyze such production complexities using the custom built software “ Synchronous Analyzer “ and analyze the Synchronous index of vital production lines. Upon continuous Engineering analyses of this index, it is expected to provide a major break through in the operation efficiency.

Key Words: Synchronous Index, Synchronous Analyzer, Production Planning, Engineering analyses, Operation Efficiency.

Introduction:

Manufacturing these days are engrossed in achieving total productivity. These systems are characterized by producing with variety of models which designers create on their drawing boards. Synchronous Manufacturing is a Manufacturing process designed to achieve harmony in production process. This essentially assimilates all vital elements of a manufacturing Industry to achieve the goals and objectives of the Company. Synchronous Manufacturing involves all wings of the organization to achieve higher

competitive advantage, ROI and Net Profit. It focuses around bottleneck resources and efficient utilization of those resources that are most constraining and prevent additional production. Synchronous Manufacturing offers industrial engineers to establish shop schedules that actually work and schedules that remain valid despite data inaccuracy, people being absent, machine breakdowns and processes generating scrap which leads to unsynchronicity. Synchronous Manufacturing schedules call for shorter lead times, faster flow and low inventory. This approach is typically fast to implement and can take the advantage of software engineering principles. Synchronous Manufacturing approach involves every aspect of the business-from sales and marketing through purchases, production, shipping, research and development, human resources etc-in working together to a degree that most managers can only imagine.

Scope: To enhance Synchronicity index of Machines in an organization.

We have made an attempt to adopt the custom built software tool Synchronous Analyzer test rig for measuring performance under this scenario. We use the test rig work area as mentioned below for setting up all required parameters. Various synchronous launches is executed to calculate the Synchronicity index.

Enterprise Parameter:

1.	Define Product:	Pid=P55		
2.	Define Machines:	M1=Facing. M2=Turning M3=Milling M4=Grinding M5=Knurling	Operation Time: 5 7 10 4 5	Shift 1 1 1 1
3	Define Delay	Men/Machine	Ex: Man-fatigue.	
4.	Order Define:	Product=P55		
	Ordered Components:	25(Test sample)		

Route:

The routing module is an important activity under this study. We define assign and then launch the process.

Define Route.

1.	Route name	Route sequence:	Starting time	Ending Time
2.	R1	M1,M3,M2,M4,M5	8:00	16:00

Assign route.

Once the routes are defined the assignment phase will be triggered and the assignment of all resources will be carried out.

Dependency:

Milling operation is not allowed before turning.

Grinding operation is not allowed before turning.

Knurling operation is not done before grinding.

If the route defined not the above condition, then that route can be placed on hold which in turn will be blocked for any scheduling. If the route defined satisfies the above condition then hold can be released.

Launch Analyses:

Once the parameters mentioned as above are set into the analyzer we are all set to launch the synchronous analyses. The system considers all dependencies and calculates the various times quickly and helps in getting the schedule at the start time and along with the end times. It is ready by this stage to enter the delay in any of the activity across any machines.

Results of the Sample Launches of the Synchronous Analyzer Test Rig

Serial Number	Launch Number	Experimenter's Name	Time of Analysis	Date of Analysis	Department Name	No of Machines	No of Personnel	Synchronous Index	Synchronous Points	Synchronous Percentage	Result
1	23	Srinivas	20:54	1/11/2006	q	4	4	1	170	86	Not Synchronised
6	33	Srinivas	20:39	1/12/2006	q	2	2	0	2400	3	Not Synchronised
7	34	Rajesh	16:32	1/13/2006	a	1	1	0	830	43	Not Synchronised
10	37	Srinivas	16:49	1/14/2006	as	6	6	0	360	44	Not Synchronised
11	38	Rajesh	16:52	1/14/2006	as	4	4	1	10	98	System is Synchronised

Delay:

Delays are due to many many factors we have classified depending upon the resources of the organization and they are as follows.

Delay due to man

Delay due to machine.

Delay due to material.

3

Strategy:

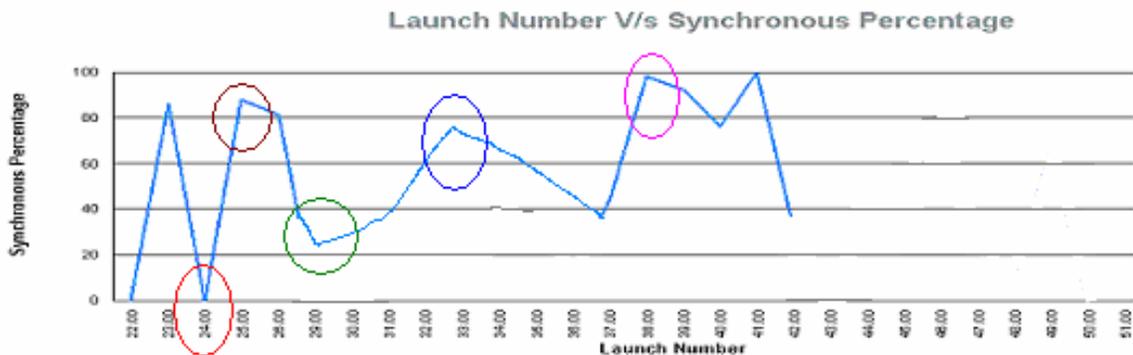
The Company has multi products and skills amongst the employee .The Company consists of many processes products and machines .It is desired to know how well they are nit together and how actually the process is yielding the output. Hence the analysis with respect to synchronous analyses is desired. The company has holiday schedules on Sunday and no production happens then. The Preventive Maintenance is executed on this day. The scope of this study is limited to running designed production schedules only. Many customers have placed order on this company and are eagerly waiting for the output. More delays for supply also delays the customer schedule and loss for the hold performance parameters of the unwanted the delays and hence improve the performance of the process.

Analysis:

Analyze the Graph for various and suitable correction made on specific synchronosity launches. In the graph shown below there are five circles with different colors indicating the variation in the graph. The first red circle indicates very low

Synchronous percentage, which is due to the existing practice in the shop floor. Once this percentage was indicated in the graph the analyst proposed some suggestions by which the shop floor people overcome that delay and increased the efficiency to certain extent as indicated in the Dark red circle .The following suggestion were made. Set up time estimation was improper hence setup time was suitably modified. The result was an improvement of about 50%.

The analyses were made again after some days to the performance. If is evident from the graph that the efficiency got reduced to 38%.Critical analyses on the issue revealed that the supervision was introduced to seek clarification on machine parameters. Hence delay occurred for the same. This lead to a side of 12% as indicated in the green circle. Again the analyst made suggestion that Due to improper supervision on material and machines on the shop floor the efficiency of the floor has reduced. And as they reintroduced supervision the efficiency improved from 38% to 58%, which is as indicated in the graph in blue graph. They continued with vigil supervision in the shop floor the efficiency improved to 70% as shown in the graph in pink circle and the process efficiency increased gradually.



Conclusion:

We conclude from the above analyses that synchronous analyzer is an effective tool for measuring the synchronous index which is a tool for analyzing the performance of any process. This will be a vital tool for an industrial engineer and can be proved to be very effective in the manufacturing areas.

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AUTHOR BIOGRAPHIES

Dr B Ravishankar is an Assistant Professor in the Department of Industrial Engineering BMS College of Engg Bangalore India. He has done his Masters in Maintenance Engg at the University of Mysore and has acquired His Doctorate in Human Factors Engg from the Bangalore University. Ravishankar is active in the areas of ERP, Software development and Implementation. He has developed key solutions to many companies. Currently he is guiding few researchers in the field of Synchronous manufacturing, Capacity Planning and Supply Chain Areas.

Ashok Mehatha is an Assistant Professor in the Department of Industrial Engineering Sri Siddartha Institute of Technology Tumkur India. He has done his Masters in Maintenance

Engg at the University of Mysore. He is currently pursuing his research leading to Ph.D, in the synchronous manufacturing areas. Ashok is also involved in TEQIP an initiative of the World Bank for the benefit of Engineering colleges in India.