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Production Plan Adherence and Digital Monitoring Requirements: An Anonymized Case Study in Automotive Component Manufacturing

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***Abstract*— In this exploratory industrial case study, we explore whether and how the production plan is respected and the level of digital monitoring needed in an anonymous automotive component manufacturer. The empirical baseline is eight days of production recorded for two coded streams (Line A and Line B) and observation of the production planning and control (PPC) routine. Overall production achievement was 73.83 percent (1,831 of 2,480 units) and overall dispatch achievement was 69.68 percent (1,512 of 2,170 units). Line A was 85.38 percent of its production plan and Line B, 40.63 percent, with Line B taking the brunt at 58.6 percent of the 649 unit production shortfall. All eight days recorded staffing shortage or late start, and four days recorded welding related problems. The reviewed records were manually entered at the end of shift, reviewed and deviations were described in a free text format, which reduced the timeliness of the deviation and limit made it less traceable. A six-layer monitoring framework is detailed to link production entry validation, plan versus actual visibility, structured exceptions, dashboards and corrective decisions. No implementation or piloting of the framework, no performance gain is attributed to it. The study provides an auditable baseline, operational observations as a basis for requirements and testable propositions for a subsequent pilot.**

Keywords—digital production monitoring, plan versus actual, production planning and control, schedule adherence, automotive manufacturing, production visibility, case study

I. INTRODUCTION

A production plan is a commitment to the Customer and to the rest of the plant. Production planning & control (PPC) are the processes that have to be carried out to release the plan, to implement the plan on the shop floor and to rectify the plan when work output is below the plan. The usefulness of the plan versus actual comparison signal is, then, directly tied to how quickly it gets to those who can make use of it, namely PPC.

This feedback loop can be reduced by using real-time shop floor data, dashboards and connected systems, which is argued by research on Industry 4.0 [1, 2]. In reality, many component plants continue to operate their daily control on spreadsheets and manual entry and review of next day. In this kind of plants a deficit is actually reported by the plant in time but in a less precise manner and the question of how important is the delay is rarely investigated using plant data.

The paper is based on a supervised industrial placement in 2026 at an automotive component manufacturing company, called Plant A. The author's work in PPC included reviewing daily production and dispatching records and watching the flow of information from production reporting to planning decisions [3]. The company name, site location, customer identities, original product codes and exact observation dates are hidden. No empirical testing of the effect of a digital intervention, existing deviations and requirements for monitoring are analysed.

The contribution is fourfold. The study compares plan to actual evidence for two coded production streams over eight days of production. Secondly, it categorizes regular operational issues. Third, it links identified weaknesses in spreadsheet-based reporting to specific monitoring requirements. Fourth, it provides a six-level framework of conceptual structure and testable propositions. Observations and hypotheses are intentionally differentiated – no digital system was tested and no improvement is promised.

The rest of the paper is organized as follows. Section II provides a description of the manufacturing context. In Sections III and IV literature is reviewed and research gap is stated. The problem, objectives and method are outlined in sections V to VII. Sections VIII to X present the existing process, the plan versus actual analysis and the constraint analysis. Sections XI to XIII give the findings, the proposed framework and the discussion. The following sections (XIV to XVII) are followed by implications, limitations, future scope and conclusions.

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A. *Manufacturing Context*

Plant A is an anonymous automotive component manufacturing plant in India. Restrictions on disclosure of information are adhered to in relation to its company name, its approximate location and its customer programs and original product identifiers. Only the operating characteristics is reported that are needed to understand the case data set. The two production streams are referred as Line A and Line B throughout.

The PPC function at the plant keeps a Daily PPC Excel workbook [4]. It shows the production plan, production done, achievement, remaining production, dispatch plan, dispatch done, dispatch achievement, stock, return, vehicles dispatched, transport cost and a free text field to record issues on the day. A separate sheet contains 13 recurring production problems and a summary sheet combines the two lines.

Line B has 80 units as its daily production target and Line A has 230 units as its daily production target. When dispatch is scheduled, the same daily targets are in effect for planned dispatch. These are separate production lines with different production volumes, they are not compared in terms of their operational capacity but compared to identify the observed gap between them.

II. LITERATURE REVIEW

The review is organized by theme. It is based on research papers found in a literature search, and it is used for conceptual support only, not as evidence of the case plant. The description of the finding of a paper follows its published abstract, where it is described..

A. *Digital Production Monitoring*

Mathiasen [5] examines the problem of monitoring adherence to manufacturing schedules on high-speed manufacturing lines using digital dashboards. The work introduces theory of constraints to the topic of data accessibility constraints, measurement methods and physical material flow constraints, and suggests that a dashboard can be effective only to the degree that the functions it serves are necessary on the shop floor. Hiller et al. [6] talk about digital twins in production control, and present an approach that continuously calculates backlog and output from dynamic data and demonstrates its use for production control decisions with an application.

B. *Real-Time Manufacturing Data*

Moor et al. [7] explain a real-time collection of production and performance data from sensors and controllers to aid in planning and execution analytics. Suleykin and Panfilov [8] introduce the architecture where production plan files are translated to an in-memory database and then can be queried near real time, applied to production plans of a truck manufacturer. Woschank et al. [2, 9] investigate the impact of real-time data and more frequent updates on planning and control strategies, lead time and work in progress (WIP) in a make-to-order manufacturer by using a discrete event simulation approach.

C. *Production Planning and Control*

Bueno et al. [1] provide a review of smart PPC in the context of Industry 4.0. They state that they have identified 18 smart capabilities including realtime capabilities, visibility and traceability, smart scheduling, etc. and correlate them with performance metrics like flexibility, agility and reliability. Du et al. [10] consider scheduling for manufacturing execution system (MES) as a dynamic scheduling process and integrate reactive and proactive approaches to deal with shop floor events. Javaid and Ullah [11] use simulation and optimization and a digital twin to create schedules so they can deal with job shop disruptions.

D. *Production Schedule Adherence*

In Sudha and Raghavan [12] the factors affecting the adherence to the production schedule are studied using the Pareto analysis and Five Whys analysis with 150 respondents based on questionnaires. They mention machine failures, non-availability of raw material, lack of manpower and inadequate planning and quality control as factors that can delay and disrupt production. They are the same classes of constraint found in the plant records studied here and the analysis of the case is a helpful reference for the interpretation of this class of constraint.

E. *Plan versus Actual Production Performance*

Bakde and Pramanik [13] study the difference between planned and actual production in a machine shop using overall equipment efficiency (OEE), pareto analysis and root cause analysis. They discover that downtime, inefficiency of the operators and disruptions in material flows are among the causes of the gap, and propose, among others, real-time monitoring. Plan versus actual deficiencies have been found to stem from a limited number of factors, but OEE demands downtime and quality inputs that the plant may not be able to achieve.

F. *Digital Dashboards and KPI Monitoring*

Gram et al. [14] suggest online identification of anomalies in the key performance indicators (KPIs) of products to identify deviation and the reasons for the loss of productivity throughout the operation rather than only at the end of the operation during manual analysis, and apply it to automated and manual assembly. Moor et al. [7] also create their analytics based on the KPIs. However, the common denominator is that a KPI can be employed for control if it is calculated and made available shortly after the event.

G. *Industry 4.0 and Smart Production Control*

Both the review of Bueno et al. [1] and the simulation studies of Woschank et al. [2] [9] agree that real-time data or connected control is likely to deliver an improvement in logistics performance, which will vary depending on the production system and planning strategy employed. In this paper the distinction between evidence from simulation and evidence from a deployed system is not lost, as is the case with evidence from simulation.

H. *Automotive Manufacturing Applications*

Papanagnou [15] uses a digital twin to an automotive assembly production plan, using captured data to review activities and productivity between shifts. Based on the reference to Zhang et al. [16], they propose a digital twin framework for the production performance analysis in mechanical parts production workshop. While there are applied studies of this type, they were not found in this review that began with a spreadsheet-based baseline and then questioned what monitoring would add.

I. *Research Gap*

Previous studies have shown that the use of digital dashboards and real-time PPC data are related to visibility and

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planning responsiveness [1], [2], [6], [14] while studies on schedule adherence have focused on downtime, staffing, material and quality limitations [12] or [13]. A more limited need is to convert an observed spreadsheet-based PPC baseline into an explicit set of monitoring requirements, exception handling logic and measurable hypotheses. The present case is about that design and diagnosis issue, it is not about "cause and effect" between digital monitoring and plan performance.

The study is based on an anonymised 8-day PPC baseline, with auditable plan versus actual calculations, coded operational issues and an observed information flow routine, and uses these to determine requirements for a proposed digital monitoring system. It offers a contribution and explorative approach, not a claim of a validated performance effect.

III. RESEARCH METHODOLOGY

A. Research Design

To gather information, a descriptive PPC data analysis was utilized and the reporting routine was noted and examined together with free-text exception entries, in an exploratory, single-site industrial case study. Each production record day for each of two coded streams is the unit of analysis. Eight day-level observations were taken at each stream. No control group, survey or inferential test or digital pilot was conducted and intervention effects and statistical generalizability cannot be drawn from the data.

B. Research Problem

Staffing, equipment, welding, materials and process disruptions are causes of production targets becoming exposed. If PPC figures and free-text are combined together following production, it may not be possible to systematically record opportunities for within shift response. Thus, the research issue was to describe plan adherence in the current reporting process and characterize what is missing in the process that can be observed and the digital requirements that could be tested in a controlled pilot.

C. Research Objectives and Questions

The key goal is to understand the baseline plan adherence and to determine the need for digital production monitoring based on a case from the industry of an anonymized automotive production plan. Specific objectives are:

- To compare plan and actual production performance on the plant on the basis of the plant data;
- To determine the principal causes of deviations from production recorded in conjunction with the operation;
- To review the weaknesses of the current monitoring system;
- To evaluate the potential of real time visibility in helping to identify deviations early; and
- To suggest a digital production monitoring model for PPC visibility and decision making.

The research questions are: RQ1: What are the actual gaps between plan and production/dispatch? RQ2: What are the operational issues recorded for the observation window? RQ3: What are the limitations of the information flow in the current PPC routine? RQ4: What are the digital monitoring capabilities that address those limitations? RQ5: What should be the criteria for assessing deviation detection, corrective response and plan adherence for a future pilot? RQ1- RQ3 involve evidence from the use case, whereas RQ4- RQ5 involve design questions (not measured outcomes)..

D. Data Sources

The main source is a limited internal PPC workbook for eight days of production recorded in 2026, Line A and Line B [4]. The author streamlined entries and cross-referenced them with the workbook summary and shop floor discussions during the placement. The proposed design was informed by an unpublished internal digital monitoring concept note [17] rather than the empirical findings. Conceptual comparisons were made from literature published. Observation dates and plant and product identifiers are not provided.

E. Data Handling

Daily achievement percentage/stream totals were recalculated and cross checked with the workbook summary. There were no duplicate day rows. For 7 days of 8, plant stock entries were missing or not the same number, and were considered unavailable, not zero. In order to calculate a daily dispatch percentage, the scheduled quantity and the actual quantity dispatched must not be both zero on one of the days. Observation Day 4 had zero scheduled quantity and zero actual quantity dispatched so no daily dispatch percentage was calculated for this day. The total output for Daily Line B from Table II is a combination of Daily Production minus Daily Output for Line A, which agrees with the workbook.

F. Measures

Three measures are used. Let P and A be planned and actual production, and P_d and A_d planned and actual dispatch, in units.

$$\text{Production achievement (\%)} = A / P \times 100 \quad (1)$$

$$\text{Production gap} = P - A \quad (2)$$

$$\text{Dispatch achievement (\%)} = A_d / P_d \times 100 \quad (3)$$

Totals are NOT the average of daily percentages but rather cumulative unit values (total actual/total plan). The daily issue text was grouped into constraint categories by the author and the number of days on which each category was mentioned was counted. This is displayed as a Pareto presentation of those counts. The count reflects only the frequency of issues and not the value of lost units due to the fact that lost units values are not available in the log.

IV. DATA ANALYSIS

A. Existing PPC and Production Monitoring Process

The following daily cycle was observed. A daily and line production plan is made. The line carries out the plan. Output is manually entered at the end of the day or shift into the Daily PPC Excel sheet. Achievement is calculated on the sheet. The exceptions are listed in free text in the issues column. The sheet is reviewed by PPC staff and supervisors normally on the next day. Corrective action (if taken) is informal and not documented in a structured field. The dispatch is managed independently and its own plan is used.

There is no evidence of automated data capture (scanning, sensor counting or system integration) in the workbook and no

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ERP-integrated workflow is recorded. Plan entry to summary consolidation is done manually and with spreadsheets. The workbook organization indicates six constraints:

- Delayed visibility. Achievement is calculated but reported only during the next manual review; none of the evidence for a same day or intra-shift alert.
- Manual consolidation. The summary sheet is the collated version of two line sheets which are maintained separately.
- Fragmented information. Production, dispatch, stock and constraint data are not one record per exception but in various columns and sheets.
- Difficult exception identification. Issues don't have a severity, an owner, nor a status, so one has to read through all the days to discover what re-occurred.
- No standard escalation. There is no indication in any of the fields if an issue is escalated, to whom, or when it is resolved.
- Limited trend analysis. There is no way to trending achievement or any restrictions for more extended periods in the Workbook.

The data do not provide support for the reasons why review is next day and not same day – these are not asserted here.

B. Production Plan versus Actual Analysis

1) Combined and Stream-Level Results

TABLE I. PRODUCTION AND DISPATCH PERFORMANCE ACROSS EIGHT OBSERVED DAYS

Metric (units)	Line A	Line B	Combined
Production plan	1,840	640	2,480
Production actual	1,571	260	1,831
Production gap	269	380	649
Production achievement (%)	85.38	40.63	73.83
Dispatch plan	1,610	560	2,170
Dispatch actual	1,320	192	1,512
Dispatch gap	290	368	658
Dispatch achievement (%)	81.99	34.29	69.68

Source: restricted internal PPC record [4]; totals recalculated and reconciled. Achievement uses cumulative actual divided by cumulative plan.

Table I gives the results (RQ1). The plant was set to produce 2,480 units over the eight days they planned, but only produced 1,831, a shortfall of 649 units or 26.17 percent of plan. The dispatch achievement rate was at 69.68 percent. Stream Line A has achieved 85.38 percent of its production plan and 81.99 percent of its dispatch plan. The Streams were 40.63 percent and 34.29 percent for Line B and B Live. Line B had 25.8 per cent of the aggregate production plan and 58.6 per cent of the aggregate production gap (380 units out of 649 units). In this data set, the top-priority stream is the same stream as the absolute-gap one.

2) Daily Variation

TABLE II. DAILY PRODUCTION ACHIEVEMENT BY STREAM

Day	Line A actual	Ach. (%)	Line B actual	Ach. (%)
1	175	76.1	47	58.75
2	201	87.4	31	38.75
3	240	104.3	49	61.25
4	230	100.0	35	43.75
5	179	77.8	16	20.00
6	230	100.0	35	43.75
7	115	50.0	20	25.00
8	201	87.4	27	33.75
Total	**1,571**	**85.38**	**260**	**40.63**

Daily plan: 230 units for Line A and 80 units for Line B. Line B output is derived as combined output less Line A output; totals reconcile to the source record.

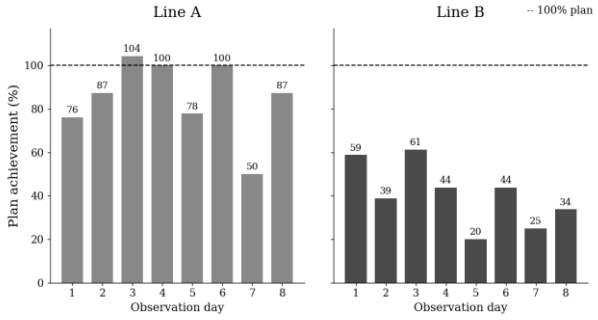


Fig. 1. Daily production achievement by anonymized stream (Days 1–8). Dashed line indicates 100 percent of plan. Line B values are derived as explained in Table II.

Different patterns are observed for the daily results (Table II and Fig. 1). Overall, Line A met or surpassed its plan on Days 3, 4 and 6, ranging from 50.0 percent (Day 7) to 104.3 percent (Day 3). Line B did not meet expectations on any of the 8 days, from 20.0 percent on Day 5, to 61.25 percent on Day 3. The former exhibits some fluctuation from day to day, the latter has a consistent, albeit minor, deficiency.

3) Production and Dispatch

The larger production shortfall (59.37 percent below plan) and the larger dispatch shortfall (65.71 percent below plan) are shown on line B. Line A shows 14.62 and 18.01 percent. As is usual— dispatch is limited by production—but because there are two streams and eight days, this is an association, not a test.

C. Analysis of Production Constraints

Entries of the free text were divided into four categories (Table III and Fig. 2). Most days the same issue text is returned against both streams, thus the log resembles a plant-wide log and counts are calculated once a day out of 8 (RQ2).

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International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 14, Issue 12, UCBO - 2026

TABLE III. RECORDED CONSTRAINT CATEGORIES ACROSS EIGHT OBSERVED DAYS

Category	Days (of 8)	Example log entry	Pattern
Manpower (shortage, late start)	8	Staffing shortfall (paraphrased)	Logged every day
Equipment / quality (welding)	4	Welding issue (paraphrased)	Recorded on Days 2–5
Material (dimensional variation)	2	Part dimension issue (paraphrased)	Recorded on Days 6–7
Equipment change	1	Equipment change (paraphrased)	Day 7, lowest Line A output

Source: author's coding of paraphrased issue log entries [4]. Counts indicate days mentioned, not production units lost.

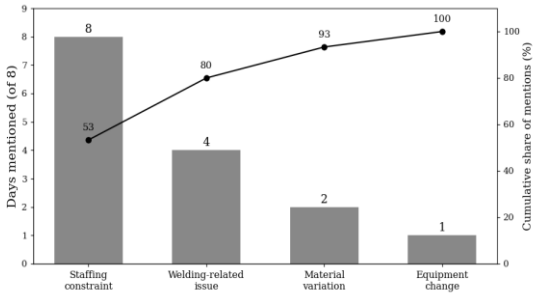


Fig. 2. Pareto of recorded issue categories (mention frequency across eight days). The shares describe entries, not causal contributions to lost output.

All eight days had staffing shortages or late starts, suggesting that the problem occurs repeatedly. The following welding problems, material dimensional variations, and equipment change were recorded: Day 2: welding; Day 6: material dimensional variation; and Day 7: material dimensional variation and equipment change. Day 7 (50.0 percent) had the lowest percentage of students achieving on Line A with over one type of issue being documented. There is no causality or additive effect in coincidence.

Care should be taken when interpreting the number of issues. Line A met plan on Days 3, 4 and 6, despite issues with staffing on Days 3 & 4. Welding problems were noted on Days 2-5 with achievement for Line A ranging between 77.8 and 104.3 percent. Therefore, it is not possible to convert into lost units for the issues mentioned. Another undated list lists other recurring themes including welding defects, low gas pressure, skilled worker availability, congestion, inspection delays, assembly interruptions, and breakdowns and fixture maintenance. It doesn't have any counts and isn't in the Pareto. No downtime hours or in-process rejections or stage-wise WIP were available, but OEE was not calculated.

V. DISCUSSIONS

A. Findings

1) Observed Findings

The following findings are based on plant records and should not be taken as projections.

- The combined production achievement was 73.83% and dispatch achievement was 69.68% over eight days of recording.
- Line A achieved 85.38 per cent and Line B 40.63 per cent of the production plan whereas Line B had no daily plan and Line B produced 58.6 per cent of the combined gap.
- The 8 days logged were 8 days for manpower shortage, 4 days for welding and 2 days for material variation, plus 1 day for a robot installation.
- The problems noted on the two streams are mostly similar and do not necessarily indicate what could be wrong with Line B on this day; a "Line B factor" not mentioned in the log is possible.
- Monitoring is manual, reviewed the following day, is fragmented and lacks structured escalation (Section VIII).
- There is no timing on the workbook to see when issues were identified so response time cannot be measured. The current process does not provide information about the rate of notification of a deviation.
- It is not possible to calculate currently OEE, downtime hours, in-process rejection rate and/or stage-wise WIP from the records..

2) Expected Benefits of the Proposed System

The following is a list of expected or potential benefits that result from the design. No one has ever been measured and no one ought to be read.

- Early identification of shortfalls with ongoing plan versus actual calculations.
- Structured exception categories for quicker and repeatable constraint analysis.
- Visible accountability for recurring exceptions such as manpower, through owner and status fields.
- Measurable delay after exceptions are stamped.
- Improved communication with PPC teams and shop floor teams and trend analysis on longer periods..

B. Suggestions

1) Proposed Digital Production Monitoring Framework

The framework converts the observed limitations into six digital monitoring functions. Its structure follows from the author's PPC process study and a limited internal concept note [17] but is only presented here as a design, rather than as an actual system (Fig. 3).

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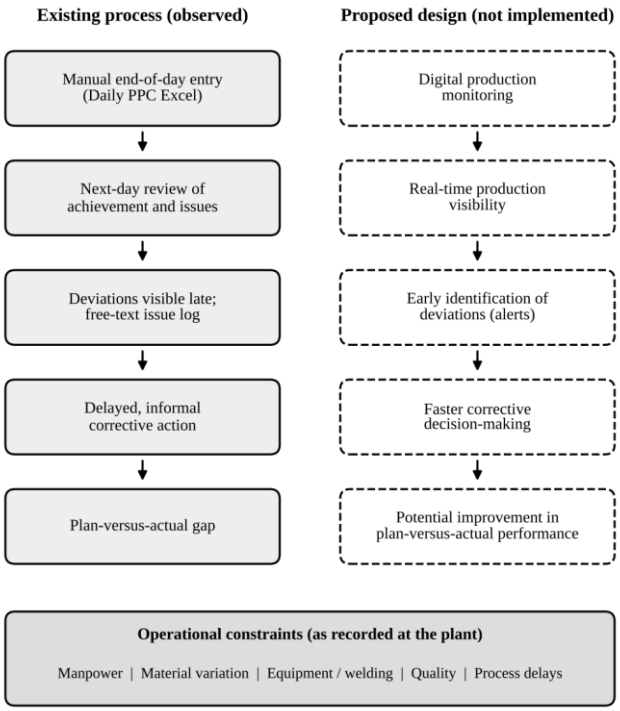


Fig. 3. Conceptual framework: existing manual monitoring (observed) and proposed digital monitoring (design only, not implemented).

- Data input. Entry of shift-wise production and dispatch (by manual, later by scan).
- Data validation. Automatic checking for omitted and/or out-of-range entries, instead of retrospective checking (Section VII.).
- Production monitoring. Continuous Plan vs Actual Calculation by Line.
- Exception management. Replacing free-text field with structured logging against defined categories with owner, status and timestamp.
- Dashboard. Role based views of plan vs. actual, achievement and open exceptions for executive, PPC, production and dispatch.
- Management decision. The time when PPC and plant management take action on surfaced exceptions.

Table IV correlates the weaknesses identified from the limited records [4] with proposed monitoring capability based on [17] and benefits that are not measured.

TABLE IV. OBSERVED WEAKNESSES AND PROPOSED CAPABILITIES

Observed weakness (evidence)	Proposed capability	Expected benefit (not measured)
Gap of 649 units seen only at next-day review	Continuous plan versus actual by line and shift	Earlier awareness of shortfalls
Free-text issue log, categorized by hand	Structured exception categories	Faster, repeatable constraint analysis
Manpower issue on 8 of 8 days, no owner or status	Owner and status tracking	Visible accountability
Line B below plan every day, cause not isolable from log	Line-level alerts and trend view	Faster detection and focused diagnosis
No timestamp on entries; response time unmeasurable	Timestamped exception capture	Response time becomes measurable

The following is proposed as a taxonomy of exceptions: production shortfall, dispatch shortfall, recurring equipment issues, staffing shortages, material shortages or material variance, quality problems. A line identifier, timestamp, assigned owner, status and closure record would be required for each event. The data is not systematically collected in the reviewed workbook. Initial implementation might involve manual shift updates, which would require automatic scanners or sensors for reliable near real-time machine output. The integration with ERP can be considered as a subsequent step.

A future pilot is needed to answer four propositions: P1: time-stamped production updates shorten the delay before deviation recorded; P2: structured exception assignment shortens the delay between exception recorded and responded; P3: shorter detected/exception recorded and response delays can help increase plan adherence where a constraint can be recovered within a shift; and P4: coded and traceable exceptions aid in the diagnosis of recurring constraints. No one proposition was tested using the data available.

C. Conclusions

The plant data reveal a discrepancy between the planned and actual data, a set of registered constraints and a monitoring procedure that reports at the end of the day. This is consistent with two aspects of the literature. The constraint families listed here are similar to the factors associated with weak schedule adherence identified by Sudha and Raghavan [12] and Bakde and Pramanik [13] respectively, as manpower, equipment and quality, and material. The monitoring shortcomings are similar to those mentioned by Mathiasen [5] and Gram et al. [14] – data needs to be available and presented in a manner that is timely for the shop floor to use.

Monitoring can't solve why Line B is failing on a daily basis if both lines have a lot of the same problems in their issues log, and it can't remove an underlying staffing problem. One possible design contribution is to design ways to improve the timeliness, specificity and ownership of the operational information, allowing later analysis of the causes of the line. This is aligned

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with data refresh frequency and PPC feedback loops studies [2] and a performance gain remains a hypothesis.

For example, an illustrative calculation can be made to give a sense of scale. If 10 percent, 20 percent or 30 percent of the 649 unit gap were recovered during the eight days of digital monitoring, the units recovered would be approximately 65, 130 or 195 units over the course of those days. The averages are assumed for illustration. These are not based on data, not predictions and not outcomes and no financial value is given as contribution per unit and implementation cost were not available.

D. Managerial Implications

- Do not have a daily note regarding a recurring manpower shortage but treat it as an exception to be owned and given a status.
- Use a defined list of issues instead of free text and include owner, status and timestamp fields. This can be done in the spreadsheet that is already in place, prior to the purchase of a new system.
- Discuss the plan of Line B with its installed capacity and staffing, which it failed to achieve on any day in the time window.
- Enable the possibility of performing OEE and bottleneck analysis by adding downtime, in-process rejection and stage-wise WIP capture.
- Have a same day review point on lines that are below a plan threshold, for corrective action (CA) to be possible during the shift.
- Roll out the framework on the one line and measure achievement and detection time before and after, prior to making a plant-wide decision..

E. Limitations

This exploratory case is for 8 days of production, 2 streams and 1 facility. Daily values for Line B were calculated from cumulative totals; categories of issues were coded by one researcher, with no independent coding. The free text log reports do not include hours or units lost, but rather frequency. There were no records to reconstruct OEE, downtime or rejection/stage-level WIP. No digital monitoring was done and no causal or financial benefit is implied from any intervention control. The company name, location, product codes and exact dates, which are essential for the safe protection of the facility, are not publicly distributed, instead they are withheld. The results of aggregates are reported without site and product names, and the use of operational figures is subject to the clearance of publication of the organisation.

F. Future Scope

With an approved longer observation window and pilot with time-stamped records, the achievement, alert delay, response delay and exception closure can be compared before and after implementation, preferably with a similar untreated line and stable definitions of plans. Further downtime, quality and WIP capture might help with OEE and bottleneck analysis. To test transferability of the design, it would need to be replicated in other plants.

G. Summary

The production plan was fulfilled by 73.83 percent at Plant A, and the dispatch plan by 69.68 percent over the 8 production days recorded, while staffing was reported on all production days at Plant A, and line B was the major contributor of the unfavored deviations from the plans. Weak timestamping and ownership of an exception and timely visibility was achieved by a spreadsheet-based monitoring system and free text issue log. The suggested six-layer digital monitoring framework outlines possible ways to overcome those limitations. It wasn't implemented so the impact on adherence is not known. Any measurable effect needs to be determined via a controlled pilot and not the present descriptive baseline.

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