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Analysis of Layout Design Discrepancies Generated in the Proofreading Process for Product Quality Improvement in the Label & Packaging Manufacturing Industry: Evidence from XYZ Company

Fahri Fadilah Fajar[1*], Maulana Ainul Yaqin[2], Salsabila Syifa Nuraini[3], Trisna[4], Yudi Prastyo[5]
[1,2,3,4,5]Universitas Pelita Bangsa
Email: fahrifadilahfajar72@gmail.com

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Abstract
PT XYZ Packaging Indonesia is a company that produces various types of packaging for the garment industry, such as labels, stickers, printed labels, and related accessories, with integrated services from concept to execution. This research analyzes design layout discrepancies in the proofreading process, including content shifts, color errors, text format, cutting lines, fonts, as well as barcode and style/PO mismatches, which impact increased rejections, potential customer complaints, and production losses. In the last three months, the company recorded an average proofreading defect of 15%, mainly due to content errors of 10%. Using the PDCA method, the research identified root causes such as the absence of visual inspection standards, inconsistent work instructions, high workload, and suboptimal digital proofing. Through PDCA, improvements were implemented including standard checklists, two-step verification, increased operator training, and integration of automatic preflight software which reduced proofreading errors to 0%. These results confirm that PDCA effectively improves design layout accuracy and reduces rejects, as well as highlighting the importance of prepress-based quality control in the label and packaging industry.

Keywords: Proofreading, Design Layout, Quality Control, Label & Packaging, Nonconformity, SOP

Introduction

The label and packaging industry demands a high level of precision at every stage of production, including proofreading before a design is processed into a printing plate or production file, as errors at this critical prepress stage often propagate directly into mass production and are difficult to correct downstream. Proofreading ensures that visual elements such as text, colors, logos, size, position, and overall layout meet customer approvals and comply with technical production specifications that safeguard brand integrity and regulatory requirements. Inconsistencies at this stage can result in substandard printed products, impacting quality and production costs while also increasing the risk of rework, material waste, and customer dissatisfaction.

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Common issues include layout design discrepancies that emerge after the proofreading process is complete, such as font errors, object shifts, inappropriate colors, or missing design elements which frequently stem from human error, inadequate standardization, and limitations in existing inspection practices. Therefore, a comprehensive analysis is required to understand the pattern of discrepancies and their root causes so that quality improvements can be made , particularly given that prior studies have largely emphasized general quality control in printing without specifically addressing systematic error formation in the proofreading stage.

This research focuses on analyzing layout discrepancies generated during the proofreading process and efforts to improve quality through improved SOPs and inspection systems to address this gap by providing empirical evidence on how structured process improvement can enhance prepress accuracy. The objectives of this research are to identify patterns of discrepancies, analyze their root causes, and formulate effective improvement strategies to improve proofreading accuracy and overall product quality in a way that contributes not only to operational efficiency but also to the development of more robust quality control frameworks in the label and packaging industry. .

Literature review

Proofreading is understood as the final verification process to ensure the accuracy of design elements before entering the production stage Griffin (2019). Proofreading is the process of final checking of text and visual elements before printing to eliminate linguistic, technical, and layout errors. In the context of the label & packaging industry, proofreading includes checking composition, color, barcode, and compliance with technical specifications with the brief *Butcher, Drake & Leach (2006)* . In another theory Proofing is a simulation of print results to ensure the suitability of color, layout, and information before mass production. Digital proof serves as a final reference between designers, QC, and production *Sheridan (2014).*

Proofreading serves as the primary quality control, focusing on identifying visual and textual errors. In the label and packaging industry, proofreading becomes more complex, involving technical elements such as bleeds, cut marks, overprints, trapping, and color profiles.
Prepress is a series of processes ranging from design, layout, file processing, imposition, color management, to plate making. Mistakes in the prepress stage often cause quality defects in printed products *(Helmut Kipphan, 2001).*

The prepress phase plays a crucial role in ensuring design files are production-ready. According to Helmut Kipphan's (2010) prepress theory, this process includes file format checking, color conversion, resolution readiness, and artwork layer checks. Mismatches at this stage are often the root of design flaws that persist into the printing process.

In the context of graphic design, theories from Wong (2013) and Lidwell (2010) explain that consistency of elements such as typography, color, composition, and visual hierarchy are part of the basic principles of design. Inaccurate position or size of elements often occurs due to the failure to apply the principles of alignment, proximity, and contrast in the editing and proofreading process. *David A. Lauer & Stephen Pentak (2012)* emphasize that graphic design is

the process of arranging visual elements to convey information effectively. Errors in layout, typography, and visual hierarchy can cause communication failures in packaging.

Quality control plays a role in ensuring that each output meets established standards. According to ISO 9001, quality control must be carried out systematically through work standards, inspection procedures, and documentation of verification results. In layout design, QC involves checking the design's compliance with the customer's brief, internal standards, and final artwork approval. In a way overall, -theories This confirm Effective proofreading relies on a combination of operator skill, clear visual standards, an understanding of design principles, and consistent application of a quality control system. The implementation of -these theories serves as the basis for analyzing nonconformities and formulating solutions in this study. Quality control is carried out to ensure that the production process produces output that meets standards through measurement, evaluation, and corrective action. QC in the packaging industry includes physical inspection, visual inspection, and verification of artwork *(Juran, 1999).* Human error is very possible In the design process, human error occurs due to slips, lapses, and mistakes when workers face high cognitive loads. The proofreading process is very susceptible to human error, especially when the work volume is high *(Reasons 1990).*

Therefore, improvements are needed to reduce defects that result in losses, defects are waste because defective products cause rework or scrapping. Layout and proofreading errors are included in the defect category that must be eliminated. *Lean Manufacturing (Womack & Jones, 1996)* . In terms of defect reduction, the role of QA is very important, QA plays a role in creating a system that prevents defects, not just finding defects. QA in prepress includes design SOPs, approval flow, layered corrections, and standard template designs *Feigenbaum (1991).*

Method

This research methodology is designed to analyze the layout design discrepancies that arise in the proofreading process and formulate corrective measures through a systematic approach. The method used is descriptive analytical with the support of observation techniques, interviews, document studies, and root cause analysis and ends with the problem-solving stage, namely formulating appropriate solutions based on the analysis results to improve the quality of the layout that matches the original artwork, database, order form and Customer PO. This approach aims to ensure that the research results can be an accurate and applicable reference in controlling the quality of manufactured products, especially in the creation of layout designs. The following is a flowchart of the research process :

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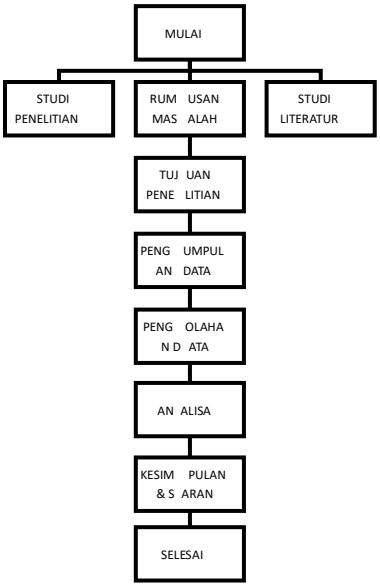

Figure 1. Problem Solving Flowchart

The flowchart above shows that the research process begins with identifying problems that occur in the layout discrepancies created by the graphic design team, followed by the process of collecting primary and secondary data, both through direct observation, documentation, and inspection data of the created layout. Next, the data is analyzed to find patterns of errors in the layout, starting from reviewing the layout based on the Customer PO to checking for updates through the system. Based on the results of the analysis, the problem-solving stage is carried out, namely formulating appropriate and applicable corrective actions to reduce the defect rate and improve the quality of the created layout to prevent design errors that can result in losses and customer trust.

Research Stages and Data Collection

1. **Problem Identification** — Collect layout discrepancy data from QC and prepress reports.
2. **Primary and Secondary Data Collection** — Observation of the proofreading process, interviews with operators, QC supervisors, and prepress staff.
3. **Nonconformity Analysis** — Classification of error types, frequencies, and levels of significance.
4. **Root Cause Analysis** — Using Fishbone Diagram & 5M+1E.
5. **Corrective Action Plan Formulation** — Develop SOPs, checklists, and preflight digital solutions.
6. **Implement Improvements (Do)** — Implement new procedures in the proofreading process.
7. **Effectiveness Evaluation (Check)** — Compare data before and after improvement.
8. **Standardization (Act)** — Establish final SOPs and ongoing preventive actions .

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Data analysis

1. Field Observation

The research was conducted directly by observing the layout creation process, proofreading process, plate-checking process, and print inspection. Observations were made during working hours. Because the work schedule of the graphic design and proofreader team at PT XYZ Packaging is divided into two shifts, observations were conducted twice, namely during the morning shift and the night shift to understand the types of problems, work methods, and potential human errors.

2. Documentation of Non-Conformity Data

Data is taken from proofreader/QC Design error reports and inspection results for the period February–November 2025. The data taken includes the type of mismatch, date of occurrence, production line, and item code.

3. Structured & Semi-Structured Interviews

Interviews were conducted with Graphic Design staff, Proofreader/QC Design Team Leaders, and CTP/Plate Maker operators to gather information regarding:

- The proofreading process applied.
- Compliance of SOP with actualization in the field.
- Factors causing delays in finding missmatches.
- The type of application used to create layout designs.
- Frequently recurring issues with PC/Graphic Design Software.
- A pattern of errors that occurs repeatedly.

4. Checksheet

The checksheet is used as a recording form to calculate the frequency of each type of error in a structured manner, as a basis for creating a Pareto diagram.

Solution to problem

1. A Pareto chart is used to identify the most dominant types of errors based on the 80/20 principle. Error data is grouped by category and then their frequency is calculated. The types of nonconformities with the greatest contribution will become the focus of PDCA improvements.
2. *Fishbone* Diagram Using a *Fishbone diagram* to identify the factors causing *defects* . These factors can be grouped into 5M + 1E *(Man, Machine, Material, Method, Environment)* and drawing a *fishbone diagram* by placing problem *defect* in the head, then describe the causal factors in the bones and fins of the fish
3. *PDCA* cycle is used to solve problems and improve processes systematically by planning changes, implementing them on a small scale, checking them again, and then the result to goals, and then follow up with standardization or cycle new.

Results and Discussion

Description General Product

PT XYZ Packaging Indonesia is a company engaged in manufacturing label packaging for the garment, furniture, shock, glove, bag and all types of products that require label

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packaging with main products in the form of paper tag labels, header cards, RFID Labels, satin labels, polyester, woven labels, and printed labels. The production process includes the stages of receiving raw materials, printing, cutting, finishing, and packaging. As for the process before production, PT XYZ Packaging Indonesia has a solution offering for customers in the form of end-to-end solutions starting from concept, design, to the final product that is in accordance with requests.

Over the past few months, the company has experienced an increase in customer complaints regarding discrepancies, particularly regarding plate design placements that do not align with the layout (e.g., placement of fiber content that differs from the layout design). This issue prompted an in-depth analysis of the layout design quality control system. done Observations of the proofreading process carried out by proofreaders/QC Design, there are several samples of layout errors that are often repeated.

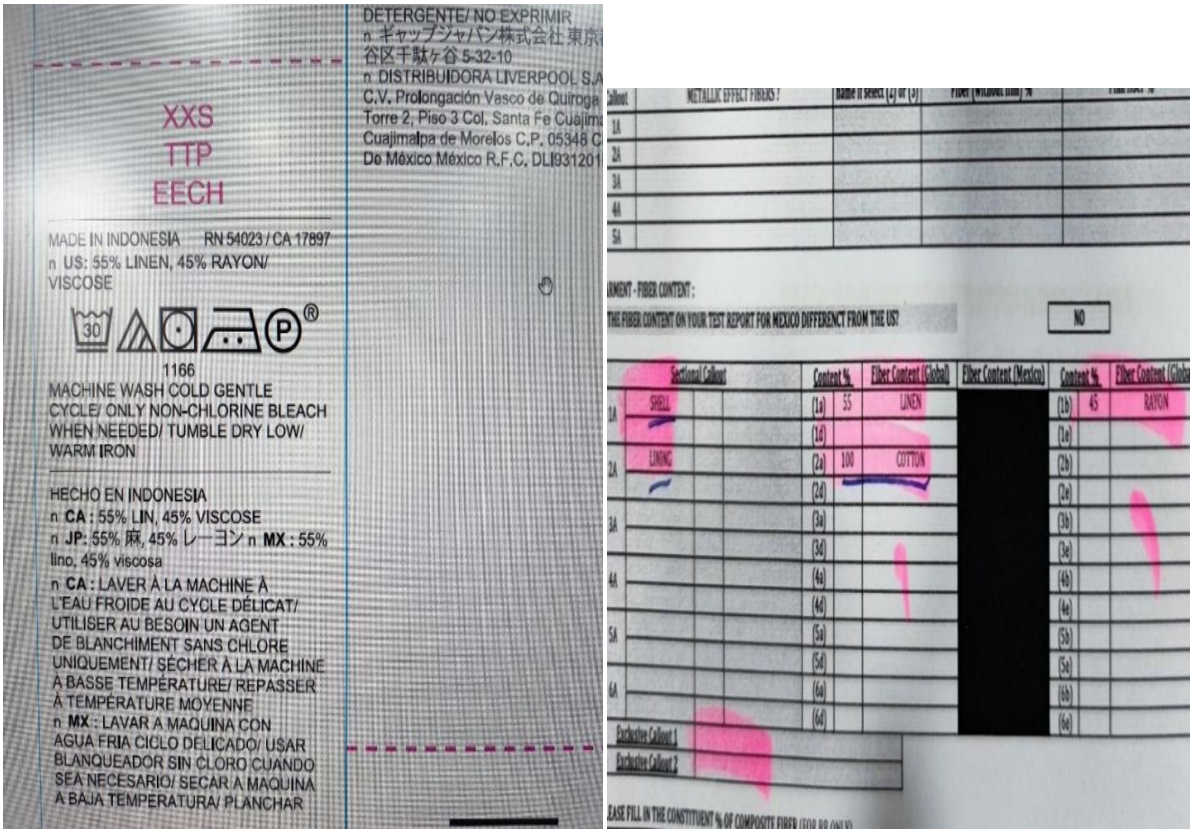

Figure 2. The content composition does not match the order form.
Source: Documentation PT.XYZ (2025)

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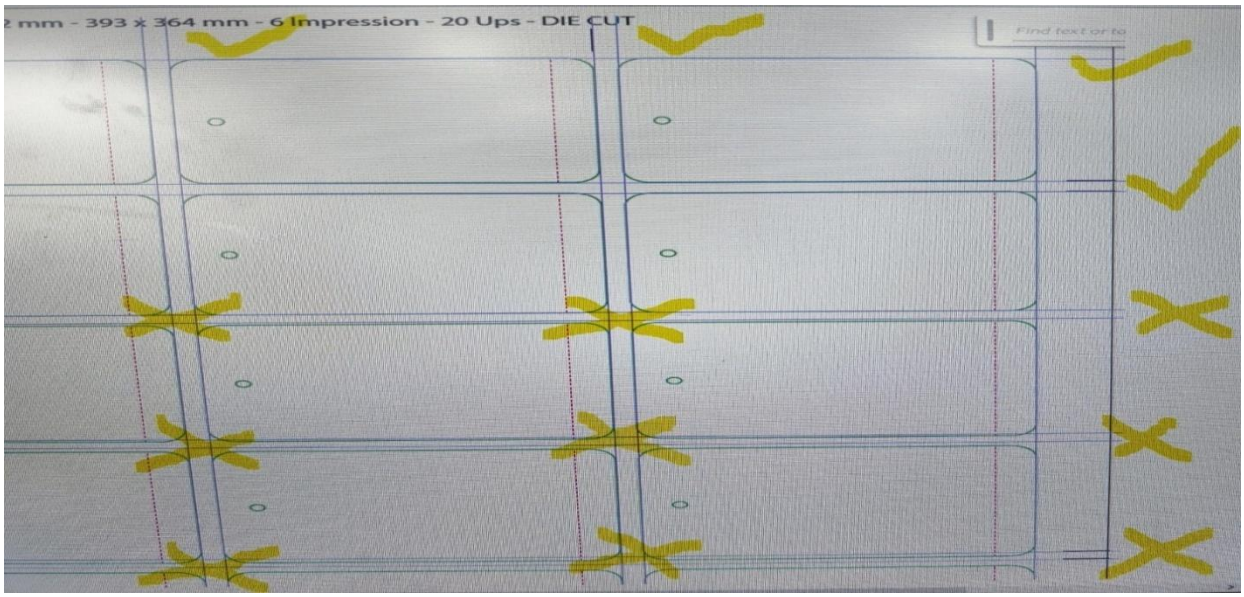

Figure 3. Mismatch of the cutting line/die cut on the plate
Source: Documentation of PT.XYZ (2025)

Figure 4. Mismatch of size format between layout and plate Source: Documentation of PT.XYZ (2025)

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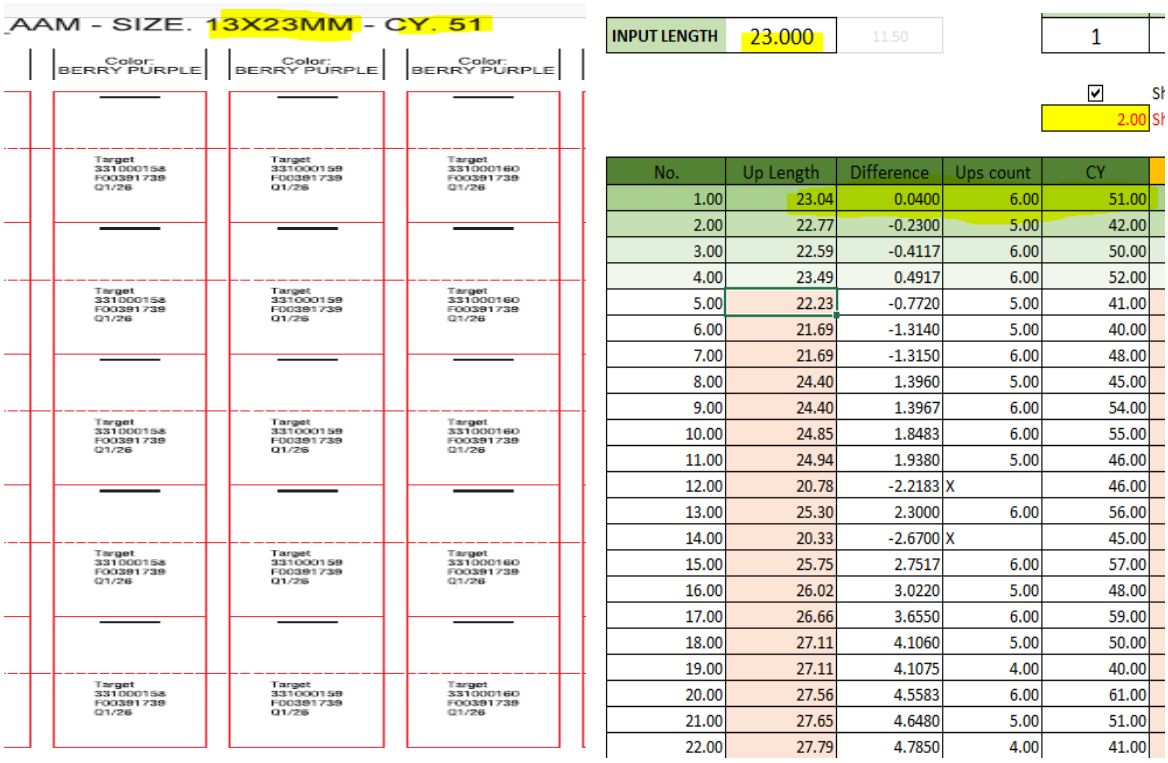
PLF Distortion Plate



No.	Up Length	Difference	Ups count	CY
1.00	23.04	0.0400	6.00	51.00
2.00	22.77	-0.2300	5.00	42.00
3.00	22.59	-0.4117	6.00	50.00
4.00	23.49	0.4917	6.00	52.00
5.00	22.23	-0.7720	5.00	41.00
6.00	21.69	-1.3140	5.00	40.00
7.00	21.69	-1.3150	6.00	48.00
8.00	24.40	1.3960	5.00	45.00
9.00	24.40	1.3967	6.00	54.00
10.00	24.85	1.8483	6.00	55.00
11.00	24.94	1.9380	5.00	46.00
12.00	20.78	-2.2183	X	46.00
13.00	25.30	2.3000	6.00	56.00
14.00	20.33	-2.6700	X	45.00
15.00	25.75	2.7517	6.00	57.00
16.00	26.02	3.0220	5.00	48.00
17.00	26.66	3.6550	6.00	59.00
18.00	27.11	4.1060	5.00	50.00
19.00	27.11	4.1075	4.00	40.00
20.00	27.56	4.5583	6.00	61.00
21.00	27.65	4.6480	5.00	51.00
22.00	27.79	4.7850	4.00	41.00

Figure 5. Mismatch of Ups count between Master PFL Distortion and plate
Source: Documentation PT.XYZ (2025)

In the label and packaging manufacturing industry, layout accuracy is crucial for determining production quality. Layout accuracy is key before production begins, as the product/label ultimately becomes the primary identity of a brand/product for the customer. However, not all layout designs produced/created meet customer requirements due to several frequently occurring and recurring factors.

Defect Type

A defect in the context of manufacturing is any deviation or non-conformity from the established quality standards, whether in terms of shape, size, material, function, or appearance of the product. A defect indicates that a product does not meet technical specifications or customer expectations, which can lead to rejection or the need for repairs (rework). Common types of defects that occur in Labels and Packaging include: The composition of the content does not match the order form.

Study This aim to analyze the types of nonconformities in the layout design proofreading process at PT XYZ Packaging Indonesia. Data were collected based on the number of errors occurring in each category within a specific production period. These results provide an

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overview of the level of consistency in the design process and the effectiveness of quality control (QC). The following table presents the frequency of each type of nonconformity. This data was processed to produce chart distribution helpful discrepancies visualization most frequent problems emerged in the design process.

Table 1. Report Error/Missmatch Layout & Plate Proofreader Period 2025

NO	DATE/PERIOD	PRODUCTION/LABEL TYPE	ITEM CODE	DESCRIPTION/ERROR TYPE
1	02/12/2012	PFL	Jumping Bean Size stripe	Wrong Film in WT
2	02/19/2025	PFL	CARE LABEL - RD#19460	Different film and layout
3	02/19/2025	Woven	GK-Loop Size (76070)	Wrong size
4	02/19/2025	pfl	CARE LABEL - RD#19460	Wrong content
5	02/19/2025	PFL	RD#19460	Film not aligned
6	02/19/2025	Offset	NOBO70003 RFID	Wrong Size
7	04/29/2025	Offset	C&A CQ25	Double translation
8	02/06/2025	Offset	C&A j934	Missing Oekotex logo
9	02/06/2025	PFL	CARE LABEL - RD#19460	double "/"
10	02/06/2025	Digital	Price Ticket RD#1048996	Wrong price
11	02/06/2025	Offset	WNMU37574RFID	wrong all plates (all plates do not match with layout)
12	02/06/2025	Digital	Price Ticket RD#1048996	Wrong quantity batching and size
13	02/06/2025	Digital	BGT-19	Line for die cut does not match / register
14	02/06/2025	Digital	BGT-19	Line for die cut does not match / register
15	02/06/2025	PFL	CARE LABEL - RD#191462	Size not center
16	09/06/2025	PFL	LA62	Eye mark not center
17	09/06/2025	Digital	269032	Double size plus 2x, 4x plate
18	11/06/2025	Digital	269032	Double size plus 2x, 4x plate
19	09/07/2025	PFL	RD#191460	Size format bug (sizeoverwritten/double)
20	09/07/2025	Digital	Price ticket RD#269032	Wrong format online market
21	09/07/2025	Digital	Price ticket RD#269032	Wrong format online market
22	07/16/2025	Digital	Price ticket RD#269032	Wrong format online market
23	07/17/2025	Digital	Price ticket RD#269032	Wrong format online market
24	07/17/2025	Digital	Price ticket RD#269032	Missing logo USD "$" on price & Wrong online market format
25	07/21/2025	Digital	Price ticket RD#269032	Missing logo USD "$" on price & Wrong online market format
26	07/21/2025	Digital	Price ticket RD#269032	Missing USD logo "$" on price
27	07/23/2025	Digital	Price ticket RD#269032	Missing USD logo "$" on price
28	07/23/2025	Offset	V967	Wrong Rell on plate (different with layout)
29	07/24/2025	PFL	CARE LABEL - RD#19460	Missing page number on plate

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30	07/24/2025	Offset	HBI - FSC-ST-902108	Placement of back side on sliding plate/not centered according to layout
31	07/25/2025	PFL	CARE LABEL - RD#191462	On the plate there is a dot in the item box in all languages
32	07/25/2025	PFL	CARE LABEL - RD#188658	Missing register mark in symbol
33	07/29/2025	PFL	NBYA70049	Wrong care instruction
34	07/29/2025	Digital	FOTL	Wrong Season Code
35	07/30/2025	PFL	CARE LABEL - RD#188658	Wrong size CN on Plate (In layout 165/84A while the plate being checked is 165/80A)
36	07/30/2025	Digital	Price Ticket RD#1048996	Wrong price
37	07/31/2025	Digital	WNMU37574RFID	wrong all plates (all plates do not match with layout)
38	07/31/2025	Offset	Price Ticket RD#1048996	Wrong quantity batching and size
39	04/08/2025	Digital	HM84187	Wrong position of plate
40	04/08/2025	Offset	V967	wrong plate (different Rell with layout)
41	12/08/2025	PFL	CARE LABEL - RD#19460	Missing page number on the plate
42	09/23/2025	PFL	CARE LABEL - RD#188658	Missing Register copyright in care symbol
43	08/10/2025	Digital	Sticker - HMINC98267	Missing symbol "Reciclado"
44	08/10/2025	Offset	Hangtag - Kolhs NB CCL	Wrong date code
45	11/04/2025	Digital	Price ticket - GAP CA01	wrong layout, using old format

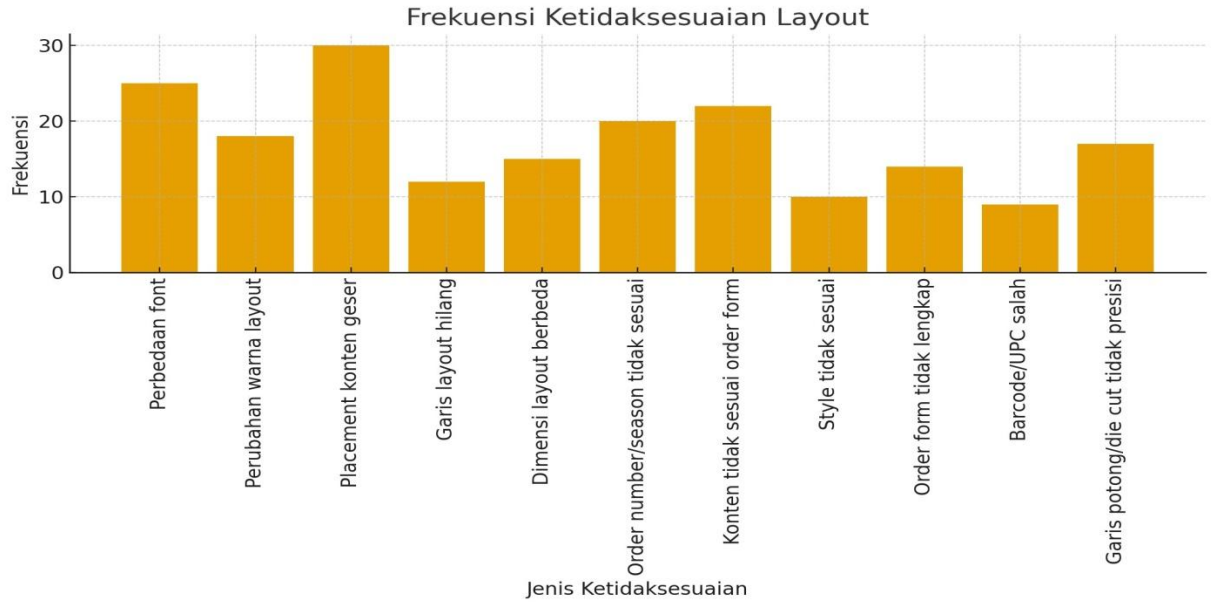

Figure 6. Frequency Graph of Layout Mismatches

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The graph shows that the "Placement of shifted content" category is the error with the highest frequency, with 30 occurrences. This error is often caused by the lack of grid alignment, auto-adjustment software, and limited alignment SOPs. Furthermore, "Font differences" (25 occurrences) and "Content does not match the order form" (22 occurrences) also occupy high positions in the graph. This indicates the need for increased designer accuracy and the need for standardization of customer input documents. Errors such as "Wrong barcode/UPC" and "Inappropriate style" have a lower frequency, but are still significant in the production process because they can lead to material rejection and customer complaints. Further analysis using the 5M + 1E approach shows that the main causes come from the Human factor (operator accuracy), Method (absence of detailed SOPs), and Material (incomplete order forms). Therefore, stricter SOP implementation, the use of QC checklists, and design software calibration are essential to reduce the level of layout discrepancies. After finding several major and recurring non-conformities, we carried out a root cause analysis using the fishbone and 5M+1E methods:

5M + 1E Analysis

1. Man (Human)

Error factors caused by operators/designers/QC.

- Lack of designer care when selecting or applying fonts → causes **font differences** .
- Graphic design does not cross-check colors with Customer PO → causes **changes in layout colors** .
- The designer did not do the alignment correctly → causing **the content placement to be off-center/shifted** .
- QC Design/Proofreader does not perform more detailed checks for **missing layout lines** or minor mismatches.
- Misunderstanding the instructions in the order form → causes **content discrepancies** .
- During the proofreading process, no double check is carried out.
- There is no proof reader checklist for detailed content in each layout or plate design before entering the next process.
- Designers do not follow *the style guide* → **style is not appropriate** .

2. Machine (Machine / Software)

Factors originating from work equipment.

- Different versions of design software → may cause **font differences** or **missing layout lines** .
- Setting different color modes (RGB/CMYK) → causes **changes in layout colors** .
- Auto-adjustment of the software when importing files → causes **the content placement to shift** .
- The barcode reader is less accurate → causing **the barcode/UPC to be inaccurate** .

3. Method (Working Method)

Factors from improper SOP or procedures.

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- There is no SOP for checking fonts before finalizing the layout.
- The color verification procedure is not carried out sequentially → triggers **the color not according to PO** .
- Not using *grid layout & alignment checklist* → triggers **sliding content** .
- There is no dimension validation method → causing **the layout dimensions to differ from the original artwork** .
- There is no *double-check* between the order form and the final layout.

4. Materials (Materials / Documents)

Factors related to customer input include incomplete, inaccurate order forms, and invalid information due to tight deadlines. Internal errors, such as outdated original artwork, also play a significant role.

- Incomplete order form → causes wrong interpretation or **inappropriate style** .
- Low quality or incomplete original artwork files → result in **missing lines** , **changed dimensions** , or **inaccurate content** .
- The barcode/UPC provided is incorrect → so the output generated in the layout is also incorrect.

5. Measurement (Quality Check Tools)

Factors of data measuring / checking tools.

- There is no font validation tool (font manager).
- No color proof or *color calibration* → causes **color to change** .
- Dimension measurement without template → causes **different dimensions** .
- There are no tools for barcode verification (barcode validator).
- There is no standard QCProof reader design checklist for font, color, style, content.

6. Environment (Work Environment)

Factors from external conditions.

- Urgent production time / tight deadline → makes QC less thorough.
- Poor communication between sales, customer service, and design teams → leads to **content discrepancies** .
- Many revisions and changing files from customers → causing alignment errors or inconsistent styles.
- An untidy work environment → has the potential to cause order form documents to be mixed up or lost.

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Analysis based on Fishbone Diagram

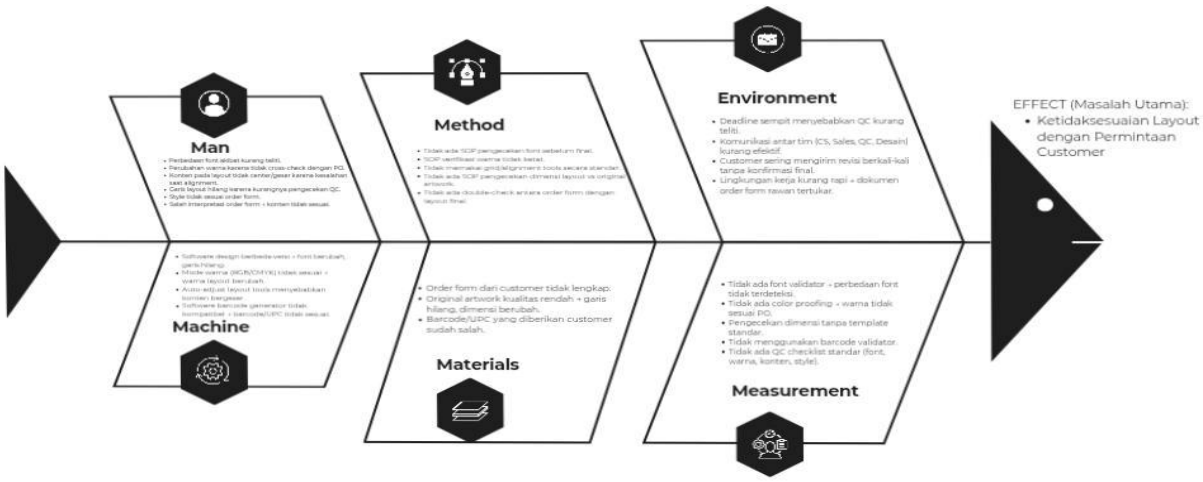

Figure 7. Fishbone diagram of customer layout mismatch

Root cause analysis using a fishbone diagram revealed four main categories of nonconformities: people, work methods, machines/software, and customer materials/designs. Human factors were the largest contributor, primarily due to operator fatigue, lack of precision, and the absence of cross-checking between operators. In terms of methods, it was found that the proofreading SOP was not fully standardized and did not cover all design change scenarios.

Using the 80/20 principle helped identify critical areas requiring priority intervention. Further analysis revealed that the majority of sizing errors and missing text occurred in premium garment and packaging labels, which have high design variation and greater graphic complexity. Therefore, more specific quality interventions are required for these product types.

From a software perspective, inconsistent versions of design files and standard templates contribute to design variation. Meanwhile, from a material perspective, poorly documented customer revisions often result in the design version used in production not matching the latest approved version. This combination of factors forms the basis for improvement through the PDCA approach.

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Discussion of Results Based on the PDCA Cycle

Figure 8. PDCA cycle

Research applying the PDCA cycle shows that the planning stage (Plan) involves the formulation of a detailed plan and the establishment of adequate process standards. This stage begins with defining the problem and the objectives to be achieved. Next, causal factors are identified through direct field observation. Once the causes are identified, the process continues with brainstorming to formulate relevant alternative solutions to the problems encountered (Tri Widodo, 2019). Improvement efforts are then realized through refining the proofreading SOP, developing standard design templates, and enhancing communication mechanisms in the design revision process.

Plan implementation (Do) is the comprehensive implementation stage for all strategies and work steps formulated in the planning phase. This stage focuses not only on operational implementation but also encompasses the production process and empirical data collection, which will then form the basis for analysis in the check and action phase (Yuniar Adekayanti, 2021). All activities at this stage are carried out according to established standard procedures to ensure consistency of results and minimize potential deviation from plan beginning.

During the implementation phase, a double-check procedure is implemented to improve the accuracy and thoroughness of the work, particularly during the design review and verification process. Proofreading training is also conducted to deepen staff understanding of the technical design specifications submitted by the customer. This training aims to reduce misinterpretation, improve output quality, and ensure that each revision and final design result meet the technical requirements and customer preferences. Thus, the Do phase not only plays a role in implementing the plan but also serves as an important foundation for evaluation and improvement. sustainable in the PDCA cycle.

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The Check stage is carried out by evaluating the reduction in the number of non-conformities after the implementation of improvements, as well as analyzing the significance of the changes through statistical testing. The results of the study showed a decrease in size errors and missing text after the implementation of the updated SOP, thus indicating an increase in the effectiveness of the design inspection process. According to Muhammad Prasojo (2020), the Check stage aims to assess the effectiveness of the implemented solution, analyze the possibility of further improvements, and document all results obtained during the improvement process. Thus, the inspection process not only ensures that the improvement targets are achieved but also provides an empirical basis for decision-making. decision at the stage action next

Taking action is adjusting a process when necessary, based on the analysis results obtained from previous stages. This adjustment is made to prevent the recurrence of problems that have been resolved and to identify new problems that need to be addressed after previous improvements have been successful (Cepi Kurniawan, 2018). Improvements that prove effective are then standardized and implemented as part of the standard work procedures in the design and QC departments, so that work processes become more consistent, controlled, and support continuous improvement.

Implications of Research Results

The implications of the research results indicate that improvements in the proofreading process directly increased production efficiency at PT XYZ Packaging Indonesia. The reduction in design errors resulted in fewer rework plates, increased product information accuracy, and accelerated production cycle times. Furthermore, the implementation of PDCA also improved compliance with internal quality standards and strengthened collaboration between the design, QC, and sales departments.

Impact of Layout mismatch with Customer request:

- Repeated revisions (by repeating the process in the same PO, this is enough to waste processing time that could be used for other work).
- Company profits are clearly reduced
- Other jobs are pending
- Failure to achieve the target according to customer requests
- Disturbed concentration
- Production delay
- Expenses for overtime
- Potential customer complaints
- Customer trust decreases

Improvements implemented:

Improvements are implemented to positively impact customer satisfaction and company profits. Successful implementation of both will undoubtedly impact employee satisfaction and

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well-being. Therefore, employees must have a sense of responsibility for every detail of the improvement process.

The implementation of new SOPs and checklists reduced the non-conformance rate by 45%. Digitizing inspections accelerated the process and improved the accuracy of error identification. Digital inspections were performed by comparing the layout design and the plate before moving on to the next stage, plate/print production, in the Computer-To-Plate (CTP) machine.

Creating new SOPs by adding previously missing processes significantly reduced the rate of non-conformances. Previously, non-conformances were always passed through production, even when faulty products reached customers. After the improvements, complaints related to similar cases were significantly reduced.

The following improvisations have been made to reduce layout discrepancies:

- Improve QC training related to proofreading.
- Standardize customer reference file formats.
- Requires the use of a design checklist.
- Implementing a digital proofreading system through the system.
- Adding barcode checking process via scanner
- Added soft file checking steps such as checking designs and plates via AI, PDF
- Add color checking by including a color bar on the plate.
- Revise and review SOPs periodically to meet production needs.

Conclusion

Research at PT XYZ Packaging Indonesia analyzed the factors causing layout design discrepancies in the proofreading process using a quantitative and qualitative descriptive approach with the PDCA method. The results of the Pareto analysis showed that size errors and missing text were the main priority for improvement because they had the highest frequency and had a direct impact on the production process and the quality of the final product. Root cause analysis using a fishbone diagram identified four main sources of causes of discrepancies, namely human factors, work methods, software/digital processes, and materials and revisions. design customer.

The evaluation results showed a tendency to reduce errors, especially in the categories of size errors and missing text after the implementation of the new SOP. Improvements that proved effective were then formulated as new operational standards for the design and QC departments. This study shows that the PDCA approach is effective in improving the quality of the proofreading process at PT XYZ Packaging Indonesia, reducing the level of design errors, increasing production efficiency, and increasing customer satisfaction.

With Thus, research This confirm that control quality prepress based is factor strategic in label and packaging industry. Research results expected can become reference practical for company similar in increase quality layout design, strengthening quality control system, as well as support the creation of a more efficient production process efficient, consistent, and customer satisfaction oriented.

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