



**2025 International Conference on
Applied Artificial Intelligence,
Data Engineering and Sciences**
Jakarta, Indonesia | 11-12 December 2025



Jakarta, 2 December 2025

ACCEPTANCE LETTER

Dear Juwika Rati (Universitas Tarumanagara, Indonesia); Lina Gozali (Tarumanagara University, Indonesia); Lamto Widodo (Universitas Tarumanegara, Indonesia),

Congratulations – your paper

1571226107 – Line Balancing and Promodel Simulation with ANN Prediction for Spare Part Production of an Oil Company

Has been accepted for presentation at ICAIDES 2025, which will be held in-person or online from 11-12 December 2025 in Jakarta.

It will be sent to the IEEE Xplore subject to:

(1) Registration and No-Show Policy

At least one author of accepted paper must register for the conference.

The paper must be presented at the conference by the registered author.

The committee reserves the right to withdraw your paper from the proceeding if it is not presented.

Information on registration and payment can be found at:

<https://bit.ly/RegistrationICAIDES2025>

(2) Addressing the comments from the reviewers:

Please address all the comments from the reviewers before you upload your camera ready paper. Authors must strictly adhere to the IEEE template, including referencing style, section headings, fonts, and all other formatting requirements. IEEE will conduct compliance checks and may reject papers that fail to conform to the template. While the TPC chairs will perform a review of camera-ready papers, the primary responsibility for ensuring compliance rests with the authors.

(3) Upload your camera ready paper to PDF Express:

Login to <https://ieee-pdf-express.org/> with Conference ID: 67265X. If you have passed the PDF checking, please download the certified PDF version of your paper and upload it to EDAS before November 01, 2025.

(4) Complete the e-copyright on EDAS system.



2025 International Conference on
Applied Artificial Intelligence,
Data Engineering and Sciences
Jakarta, Indonesia | 11-12 December 2025



(5) Add the presenter on EDAS system.

The online presenters for ICAIDES 2025 are required to upload a pre-recorded video of their paper presentation on EDAS system by November 30, 2025. The presentation is recorded by the registered presenter. The registered presenter must attend his/her allocated conference session. The pre-recorded video will be played and Q&A session will be held afterwards.

Link for video presentation upload are available on the following link

<https://bit.ly/PresentationVideoICAIDES2025>

We look forward to meeting you at **ICAIDES 2025**, Indonesia.

Sincerely,

A blue ink signature of Assoc. Prof. Dr. Ir. Hugeng, S.T., M.T., SMIEEE, IPU, written over the ICAIDES logo.

Assoc. Prof. Dr. Ir. Hugeng, S.T., M.T., SMIEEE, IPU
General Chair of 2025 ICAIDES



Lina Gozali 吳水艳 <linag@ft.untar.ac.id>

[ICAIDES 2025] Acceptance Notification: Your paper #1571226107 ('Line Balancing and Promodel Simulation with ANN Prediction for Spare Part Production of an Oil Company')

1 message

ICAIDES 2025 <icaides2025-chairs@edas.info>

Mon, Nov 24, 2025 at 9:21 AM

To: Juwika Rati <Juwika545220044@stu.untar.ac.id>, Lina Gozali <linag@ft.untar.ac.id>, Lamto Widodo <lamtow@ft.untar.ac.id>

Dear Juwika Rati, Lina Gozali and Lamto Widodo,

Congratulations - your paper #1571226107 "Line Balancing and Promodel Simulation with ANN Prediction for Spare Part Production of an Oil Company" for ICAIDES 2025 has been accepted for presentation at 2025 International Conference on Applied Artificial Intelligence, Data Engineering and Sciences (ICAIDES), which will be held both online and in-person from 11th to 12th December, 2025. It will be sent to the IEEE Xplore subject to:

(1) Registration and No-Show Policy:

At least one author of the accepted paper is required to register for the conference and the paper must be presented at the conference. IEEE reserves the right to exclude a paper from distribution after the conference if the paper is not presented at the conference.

The registration and payment information of ICAIDES 2025 is provided at <https://icaides.untar.ac.id/page/6/Conference-Registration>.

(2) Addressing the comments from the reviewers:

Please address all the comments from the reviewers before you upload your camera ready paper. **Authors must strictly adhere to the IEEE template, including referencing style, section headings, fonts, and all other formatting requirements. IEEE will conduct compliance checks and may reject papers that fail to conform to the template. While the TPC chairs will perform a review of camera-ready papers, the primary responsibility for ensuring compliance rests with the authors.**

Please remove the footer "XXX-X-XXXX-XXXX-X/XX/XX.00 ©20XX IEEE" and all page number in your paper, as they will be automatically generated upon publication on IEEE Xplore. Ensure that all authors mentioned in your paper are also registered in the EDAS system. Additionally, verify that the abstract of your paper matches the one recorded in the EDAS system.

(3) Upload your camera ready paper to PDF Express:

Login to <https://ieee-pdf-express.org/> with Conference ID: 67265X. If you have passed the PDF checking, please download the certified PDF version of your paper and upload it to EDAS before the deadline.

(4) Complete the e-copyright on EDAS system.

(5) Add the presenter on EDAS system.

The online presenters for ICAIDES 2025 are required to upload a pre-recorded video of their paper presentation on EDAS system. The presentation is recorded by the registered presenter. The registered presenter must attend his/her allocated conference session. The pre-recorded video will be played and Q&A session will be held afterwards.

The guidelines for preparing the video is available at <https://icaides.untar.ac.id/page/23/Online-Presentation>.

The presentation schedule will be updated on the ICAIDES 2025 website <https://icaides.untar.ac.id/page/25/Schedule>. We are looking forward to meeting you at ICAIDES 2025.

Thank you and best regards,

TPC Chairs

Regular review 1

Submission policy: Does the paper list the title and abstract in its PDF file and EDAS registration?

Yes

Recommended changes: Recommended changes. Please indicate any changes that should be made to the paper if accepted.

Although the idea is interesting, the paper is not written according to the template.

Moreover, please define the contribution in the introduction section so that it is clear what to expect.

Relevance and timeliness: Rate the importance and timeliness of the topic addressed in the paper within its area of research.

Good (3)

Technical content and scientific rigour: Rate the technical content of the paper (e.g.: completeness of the analysis or simulation study, thoroughness of the treatise, accuracy of the models, etc.), its soundness and scientific rigour.

Sufficient - Enough new technical content for publication. Some technical arguments or information may be missing or incomplete, but nevertheless the main contribution appears correct or can be corrected. (2)

Novelty and originality: Rate the novelty and originality of the ideas or results presented in the paper.

Limited - minor or incremental improvements to already published methods / results. (2)

Quality of presentation: Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references.

Poor - Very difficult to comprehend, unclear. Very hard to read. Clearly below publishable quality. (1)

Overall Recommendation: What is your recommendation

Weak Accept: You think the paper is only just good enough to be accepted, but have no problem with it being rejected if that is the view of others. (4)

Regular review 2

Submission policy: Does the paper list the title and abstract in its PDF file and EDAS registration?

Yes.

Recommended changes: Recommended changes. Please indicate any changes that should be made to the paper if accepted.

This article should explicitly state the specific contribution of the ANN prediction and Promodel simulation mentioned in the title within the abstract and body, as they are currently underdeveloped. All figures (1, 2, 3, 4) must be included and properly referenced in the final manuscript to support the methodology and results. Finally, the references should be formatted according to the specific IEEE guidelines to ensure consistency.

Relevance and timeliness: Rate the importance and timeliness of the topic addressed in the paper within its area of research.

Limited (2)

Technical content and scientific rigour: Rate the technical content of the paper (e.g.: completeness of the analysis or simulation study, thoroughness of the treatise, accuracy of the models, etc.), its soundness and

scientific rigour.

Sufficient - Enough new technical content for publication. Some technical arguments or information may be missing or incomplete, but nevertheless the main contribution appears correct or can be corrected. (2)

Novelty and originality: Rate the novelty and originality of the ideas or results presented in the paper.

Limited - minor or incremental improvements to already published methods / results. (2)

Quality of presentation: Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references.

Below average - Can be understood but requires substantial effort on the part of the reader. (2)

Overall Recommendation: What is your recommendation

Weak Reject: You think the paper is just below the standard required for acceptance, but have no problem with it being accepted if that is the view of others. (3)

Regular review 3**Submission policy: Does the paper list the title and abstract in its PDF file and EDAS registration?**

Yes

Recommended changes: Recommended changes. Please indicate any changes that should be made to the paper if accepted.

While the content is good and sufficient for a conference paper, the paper presentation is not acceptable. Please follow IEEE format strictly. All co-authors must check the quality of the presentation prior submission!

Relevance and timeliness: Rate the importance and timeliness of the topic addressed in the paper within its area of research.

Good (3)

Technical content and scientific rigour: Rate the technical content of the paper (e.g.: completeness of the analysis or simulation study, thoroughness of the treatise, accuracy of the models, etc.), its soundness and scientific rigour.

Sufficient - Enough new technical content for publication. Some technical arguments or information may be missing or incomplete, but nevertheless the main contribution appears correct or can be corrected. (2)

Novelty and originality: Rate the novelty and originality of the ideas or results presented in the paper.

Limited - minor or incremental improvements to already published methods / results. (2)

Quality of presentation: Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references.

Poor - Very difficult to comprehend, unclear. Very hard to read. Clearly below publishable quality. (1)

Overall Recommendation: What is your recommendation

Weak Accept: You think the paper is only just good enough to be accepted, but have no problem with it being rejected if that is the view of others. (4)

IEEE COPYRIGHT AND CONSENT FORM

To ensure uniformity of treatment among all contributors, other forms may not be substituted for this form, nor may any wording of the form be changed. This form is intended for original material submitted to the IEEE and must accompany any such material in order to be published by the IEEE. Please read the form carefully and keep a copy for your files.

Line Balancing and Promodel Simulation with ANN Prediction for Spare Part Production of an Oil Company

Ms. Juwika Rati, Ms. Lina Gozali and Dr. Lamto Widodo

2025 International Conference on Applied Artificial Intelligence, Data Engineering and Sciences (ICAIDES)

COPYRIGHT TRANSFER

The undersigned hereby assigns to The Institute of Electrical and Electronics Engineers, Incorporated (the "IEEE") all rights under copyright that may exist in and to: (a) the Work, including any revised or expanded derivative works submitted to the IEEE by the undersigned based on the Work; and (b) any associated written or multimedia components or other enhancements accompanying the Work.

GENERAL TERMS

1. The undersigned represents that he/she has the power and authority to make and execute this form.
2. The undersigned agrees to indemnify and hold harmless the IEEE from any damage or expense that may arise in the event of a breach of any of the warranties set forth above.
3. The undersigned agrees that publication with IEEE is subject to the policies and procedures of the [IEEE PSPB Operations Manual](#).
4. In the event the above work is not accepted and published by the IEEE or is withdrawn by the author(s) before acceptance by the IEEE, the foregoing copyright transfer shall be null and void. In this case, IEEE will retain a copy of the manuscript for internal administrative/record-keeping purposes.
5. For jointly authored Works, all joint authors should sign, or one of the authors should sign as authorized agent for the others.
6. The author hereby warrants that the Work and Presentation (collectively, the "Materials") are original and that he/she is the author of the Materials. To the extent the Materials incorporate text passages, figures, data or other material from the works of others, the author has obtained any necessary permissions. Where necessary, the author has obtained all third party permissions and consents to grant the license above and has provided copies of such permissions and consents to IEEE

You have indicated that you DO wish to have video/audio recordings made of your conference presentation under terms and conditions set forth in "Consent and Release."

CONSENT AND RELEASE

1. In the event the author makes a presentation based upon the Work at a conference hosted or sponsored in whole or in part by the IEEE, the author, in consideration for his/her participation in the conference, hereby grants the IEEE the unlimited, worldwide, irrevocable

permission to use, distribute, publish, license, exhibit, record, digitize, broadcast, reproduce and archive, in any format or medium, whether now known or hereafter developed: (a) his/her presentation and comments at the conference; (b) any written materials or multimedia files used in connection with his/her presentation; and (c) any recorded interviews of him/her (collectively, the "Presentation"). The permission granted includes the transcription and reproduction of the Presentation for inclusion in products sold or distributed by IEEE and live or recorded broadcast of the Presentation during or after the conference.

2. In connection with the permission granted in Section 1, the author hereby grants IEEE the unlimited, worldwide, irrevocable right to use his/her name, picture, likeness, voice and biographical information as part of the advertisement, distribution and sale of products incorporating the Work or Presentation, and releases IEEE from any claim based on right of privacy or publicity.

BY TYPING IN YOUR FULL NAME BELOW AND CLICKING THE SUBMIT BUTTON, YOU CERTIFY THAT SUCH ACTION CONSTITUTES YOUR ELECTRONIC SIGNATURE TO THIS FORM IN ACCORDANCE WITH UNITED STATES LAW, WHICH AUTHORIZES ELECTRONIC SIGNATURE BY AUTHENTICATED REQUEST FROM A USER OVER THE INTERNET AS A VALID SUBSTITUTE FOR A WRITTEN SIGNATURE.

Lina Gozali

13-01-2026

Signature

Date (dd-mm-yyyy)

Information for Authors

AUTHOR RESPONSIBILITIES

The IEEE distributes its technical publications throughout the world and wants to ensure that the material submitted to its publications is properly available to the readership of those publications. Authors must ensure that their Work meets the requirements as stated in section 8.2.1 of the IEEE PSPB Operations Manual, including provisions covering originality, authorship, author responsibilities and author misconduct. More information on IEEE's publishing policies may be found at

http://www.ieee.org/publications_standards/publications/rights/authorrightsresponsibilities.html Authors are advised especially of IEEE PSPB Operations Manual section 8.2.1.B12: "It is the responsibility of the authors, not the IEEE, to determine whether disclosure of their material requires the prior consent of other parties and, if so, to obtain it." Authors are also advised of IEEE PSPB Operations Manual section 8.1.1B: "Statements and opinions given in work published by the IEEE are the expression of the authors."

RETAINED RIGHTS/TERMS AND CONDITIONS

- Authors/employers retain all proprietary rights in any process, procedure, or article of manufacture described in the Work.
- Authors/employers may reproduce or authorize others to reproduce the Work, material extracted verbatim from the Work, or derivative works for the author's personal use or for company use, provided that the source and the IEEE copyright notice are indicated, the copies are not used in any way that implies IEEE endorsement of a product or service of any employer, and the copies themselves are not offered for sale.
- Although authors are permitted to re-use all or portions of the Work in other works, this does not include granting third-party requests for reprinting, republishing, or other types of re-use. The IEEE Intellectual Property Rights office must handle all such third-party requests.
- Authors whose work was performed under a grant from a government funding agency are free to fulfill any deposit mandates from

that funding agency.

AUTHOR ONLINE USE

- **Personal Servers.** Authors and/or their employers shall have the right to post the accepted version of IEEE-copyrighted articles on their own personal servers or the servers of their institutions or employers without permission from IEEE, provided that the posted version includes a prominently displayed IEEE copyright notice and, when published, a full citation to the original IEEE publication, including a link to the article abstract in IEEE Xplore. Authors shall not post the final, published versions of their papers.
- **Classroom or Internal Training Use.** An author is expressly permitted to post any portion of the accepted version of his/her own IEEE-copyrighted articles on the author's personal web site or the servers of the author's institution or company in connection with the author's teaching, training, or work responsibilities, provided that the appropriate copyright, credit, and reuse notices appear prominently with the posted material. Examples of permitted uses are lecture materials, course packs, e-reserves, conference presentations, or in-house training courses.
- **Electronic Preprints.** Before submitting an article to an IEEE publication, authors frequently post their manuscripts to their own web site, their employer's site, or to another server that invites constructive comment from colleagues. Upon submission of an article to IEEE, an author is required to transfer copyright in the article to IEEE, and the author must update any previously posted version of the article with a prominently displayed IEEE copyright notice. Upon publication of an article by the IEEE, the author must replace any previously posted electronic versions of the article with either (1) the full citation to the IEEE work with a Digital Object Identifier (DOI) or link to the article abstract in IEEE Xplore, or (2) the accepted version only (not the IEEE-published version), including the IEEE copyright notice and full citation, with a link to the final, published article in IEEE Xplore.

Questions about the submission of the form or manuscript must be sent to the publication's editor.

Please direct all questions about IEEE copyright policy to:

IEEE Intellectual Property Rights Office, copyrights@ieee.org, +1-732-562-3966

CERTIFICATE OF APPRECIATION

**INTERNATIONAL CONFERENCE ON THE APPLIED ARTIFICIAL INTELLIGENCE, DATA
ENGINEERING AND SCIENCES 2025**

This certificate is presented to:

Lina Gozali, ST.,MM.,Ph.D

For participating as,

Presenter

With title: Line Balancing and Promodel Simulation with ANN
Prediction for Spare Part Production of an Oil Company

December 11th-12th, 2025 at Universitas Tarumanagara




Prof. Dr. Amad Sudiro, S.H., M.H., M.Kn., M.M.
Rector of Universitas Tarumanagara




Dr. Ir. Hugeng, S.T.,M.T.,SMIEEE.,IPU
General Chair

Line Balancing and Promodel Simulation with ANN Prediction for Spare Part Production of an Oil Company

1st Juwika Rati

Industrial Engineering Dept
Universitas Tarumanagara
West Jakarta, Indonesia
juwika.545220044@stu.untar.ac.id

2nd Lina Gozali

Industrial Engineering Dept
Universitas tarumanagara
West Jakarta, Indonesia
linag@ft.untar.ac.id

3rd Lamto Widodo

Industrial Engineering Dept
Universitas Tarumanagara
West Jakarta, Indonesia
lamtow@ft.untar.ac.id

Abstract— PT XYZ manufactures components for the oil and gas sector. Although the company faces challenges with PT XYZ's X-Over line (one of the company's highest-volume products), the line's unproductive time is also a challenge. Negative, unproductive time challenges during production processes reduce overall efficiency, thereby hindering the company's ability to meet its daily targets. The current study focuses on line balancing to address the issues described with the production lines. The specific methods for the current study include line balancing with the Kilbridge-Wester, Helgeson-Birnie, Moodie-Young, and J-Wagon techniques to establish conventional methods. After implementing production line balancing, production efficiency increased from 20.07% to 76% with the addition of an ID machine, which is the longest process on the production line. The addition of machines in this study was also based on production unit demand for the following month, using the Artificial Neural Network method. The company expects the advancements to reduce unproductive time and resource waste, thereby improving overall efficiency and PT XYZ's competitive advantage in the oil and gas sector.

Keywords— *line balancing, line efficiency, cycle time, balance delay, smoothness index, artificial neural network.*

I. INTRODUCTION

During Industry 4.0, the manufacturing industry faces greater global competition. For customers, the most critical factor is the industry's relative efficiency and productivity. A common and perhaps most important challenge is the imbalance of workflow and line balancing, leading to unproductive phases at some production stations and extended periods of inactivity at others. Such a scenario can reduce overall production output, increase waiting times, disrupt daily goals, and ultimately diminish net profits. Adaptive approaches to balancing production lines have relied on conventional heuristics and often become rigid when operational processes change, such as due to demand fluctuations, variations in working hours, or unplanned machine breakdowns. [1].

Due to the outstanding complexity and high precision of components in the oil and gas industry, as well as the high modularity of end products, challenges arising in the oil and gas sector, particularly on the X-Over line, are becoming increasingly severe and urgent. For PT XYZ, the Oil and gas spare parts manufacturer, and for PT XYZ, for high volume X-Over lines, the first steps of the X-Over line exhibit increasing severity and urgency. The most significant challenges arise at the first steps of the X-Over line, where there are significant backlogs in the primary integration finishing steps, during which units are held for assembly[2]. In contrast, testing completed components, including those tightly coupled, is discouragingly unscheduled [3].

Consequently, the global market performance and the industry's resilience are negatively impacted. This condition is due to the failure to maintain the industry threshold for overall equipment effectiveness (OEE). Although previous literature reviews have explored the optimisation of production line balancing through traditional methods, the application of these methods to discrete assembly lines such as X-Over is still minimal, mainly because solving this line balancing problem is also aided by forecasting unit demand for the coming year [4][5][6][7].

II. LITERATURE REVIEW

A. Line Balancing

Line balancing is a process used to evenly distribute the workload across each stage or workstation in the production line. The main objective of line balancing is to minimise waiting and idle time so that the line aligns with the predetermined production cycle time. The flow mapping approach in the manufacturing industry emphasises balance, thereby facilitating efficiency improvements and reducing waste [8].

B. Line Balancing Method

- The Killbridge-Wester method provides a framework for anticipating potential inaccuracies and maintaining operational competence and time consistency on the production line. Tasks are allocated to specific production units so that the time required to complete each task in each unit is aligned with the desired cycle time, with minimal time differences and congestion. [9].
- Helgeson Birnie, also known as rank-position weighting (RPW), helps prioritise task assignments to improve production line balance by consolidating workloads based on task completion time and sequence within the task dependency structure. [10].
- Moodie Young focuses on balancing efficiency through various approaches to task allocation. This method emphasises prioritising tasks by hierarchy and time requirements to ensure timely completion and minimise congestion. This approach has been proven effective in efficiently reducing idle time, thereby improving the smoothness index on the production line. [11].
- The J-Wagon method is carried out by combining position analysis measured based on time for a sequence of mandatory tasks consisting of sequence diagrams and elements sorted by time. Tasks are sorted by position and balanced by distance to the final