CHAPTER IV
RESULTS AND DISCUSSION

4.1 Results

This chapter presents the results of the development process of the Glossary for Telecommunication Glossary, which was designed to be compact and lightweight, making it practical for use by policy analysts, students, and professionals from both technical and non-technical backgrounds. This glossary is designed to support understanding of technical terms in the field of telecommunications. These terms can be challenging, especially for individuals involved in drafting policy documents, participating in international negotiations, or working in regulation within the communication and digital sectors. The development of this product follows the research methodology proposed by Borg and Gall (1983).

The Telecommunication Glossary consists of 137 pages, including the front cover, back cover, acknowledgements, background, table of contents, and the main content. The content is divided into three subsections: Radiocommunication, Standardization, and Development encompasses a total of 225 terms. The writer placed particular emphasis on the Radiocommunication section, which contains 75 terms arranged alphabetically across 25 letters. The distribution of terms is as follows: A (4), B (3), C (2), D (2), E (2), F (3), G (4), H (3), I (2), J (2), K (1), L (2), M (2), N (1), O (1), P (1), Q (1), R (2), S (2), T (3), U (1), V (1), W (1), X (1), and Z (1).

Initial term selection was based on a glossary published by the Ministry of Communication and Digital Affairs through their Spreadsheet Document. These terms were then selected and adapted to be included in the Telecommunication Glossary. The glossary provides definitions and example sentences in both Indonesian and English. This helps readers to better understand the context and usage of each term. Several Illustrations and figures were also included in this glossary due to enhance the readers understanding of the glossary content. To make sure it was correct and related to the topic, the definitions were used from online dictionaries, ITU-T recommendation

documents, and several Ministerial Regulations issued by the Ministry of Communication and Digital Affairs (MCDA). Example sentences were also taken from official documents published by the International Telecommunication Union (ITU), International Maritime Satellite Organization (IMSO), and International Telecommunication Satellite Organization (ITSO) through their website itu.int/en/ITU-R, imso.org, itso.int, to illustrate how the terms are used in formal, technical telecommunications contexts, particularly in radiocommunication.

4.1.1 The Process of Creating Telecommunication Glossary

4.1.1.1 Research and Data Collecting

The idea to create the product came about when the writer noticed that policy analysts and interns with non-technical backgrounds often had difficulty understanding the technical English used in translations and official documents. This lack of understanding often led to misunderstandings, which could make the documents inaccurate. Furthermore, the existing glossary was only referenced during discussions about drafting regulations or ministerial decrees and was not easily accessible as a general reference tool. Therefore, there is a need for a systematic, easily accessible guide to support cross-disciplinary understanding in the field of telecommunications.

Initial data collection was needed to understand the needs of the Ministry of Communication and Digital Affairs regarding a product that could assist policy analysts, professionals, and students in translating technical documents. Data collection was conducted through semi-structured interviews with open-ended questions with policy analysts from the Ministry of Communication and Digital Affairs. These interviews took place on May 9 and 15, 2025 at Ministry of Communication and Digital Affairs Office. The discussions focused on the following topics:

a. Interview Result with Policy Analyst with Technical Background

The first interview was conducted Yusuf Hasan Akbar, a policy analyst with a technical background. The interview took place on May 9, 2025, at the Ministry of

Communication and Digital Affairs office. During the interview, he shared his experiences translating technical policy documents from English into Indonesian and the challenges he encountered.

One significant experience he mentioned was translating the final document from the 2023 World Radiocommunication Conference (ITU-WRC23). The Ministry of Communication and Digital Affairs later used this document as the basis for a ministerial regulation, which serves as an official reference for frequency spectrum management in Indonesia. In practice, the use of certain frequency bands must be harmonized across countries to avoid interference. Translating this document required a high level of accuracy because even minor errors in punctuation or interpretation could substantially change the meaning.

The Interviewee explained that one of the main challenges in his work is transferring knowledge from technical teams to sworn translators because many telecommunications terms are highly specialized and difficult for outsiders to understand. Additionally, aligning interpretations of technical phrases or clauses often takes time, especially when their meanings depend heavily on context. To address these challenges and ensure translation accuracy, the interviewee employs three main strategies: enlisting technical units or experienced linguists to validate terms, consulting the original text or contacting the publisher when uncertain, and referring to widely accepted official sources.

In response to a question about the need for innovation in translation support tools, the interviewee stated that specialized resources or tools would be extremely helpful, particularly in accelerating the slow and time-consuming translation process. They also noted that such innovations could help the communications sector adapt to rapid changes more easily.

Overall, the interview underscored the urgent need for support tools like the Telecommunication Glossary. These tools could bridge the gap between technical and non-technical stakeholders, ensuring an accurate and consistent understanding and translation of telecommunications terminology.

b. Interview Result with Policy Analyst with Non-Technical Background

The second interview was held Annissa Aprilia Riesky, a policy analyst with a nontechnical background. The interview took place on May 9, 2025, at the Ministry of Communication and Digital Affairs office. During the interview, she shared her experiences translating technical policies from English into Indonesian and the challenges she encountered.

She frequently engages in translation work within the context of international cooperation. One challenge she noted is that different organizations often have specific terms that are commonly used in their internal contexts. For instance, the ITU uses the term “universal and meaningful connectivity,” which has particular criteria that may not apply to other organizations. Another recurring challenge arises during the drafting of documents, such as resolutions or joint statements. Differences in interpretation can significantly affect the direction of discussions and Indonesia’s negotiation stance. Therefore, it is important to understand not only the literal meaning of terms, but also the context and political or social sensitivities associated with them.

To ensure accurate translations, the interviewee consults technical directorates with a deeper understanding of the subject matter. She also communicates with other ministries, such as the Ministry of Foreign Affairs, especially when dealing with sensitive issues involving terminology related to gender and other topics. Her main sources of reference include the ITU Standardization Glossary and other international documents.

The Interviewee emphasized the need for innovative translation support tools. She noted that a glossary containing frequently used vocabulary in international forums would help maintain consistency and strengthen Indonesia’s position in policy documents. These tools would also prevent misinterpretations that could affect diplomatic relations or national policy.

Based on this interview, it is clear that support tools, such as the Telecommunication Glossary, are highly relevant, especially in bridging the gap

between non-technical and technical stakeholders. Such initiatives have the potential to enhance internal capacity for accurately and sensitively translating technical terms in alignment with global developments.

c. Interview Result with Head of Resources and Emerging Technologies Subdivision

The third interview was conducted Sri Sunardi as the Head of the Resources and Emerging Technologies Subdivision. The interview took place on May 15, 2025, at the Ministry of Communication and Digital Affairs office. During the discussion, Sunardi offered a new perspective on translating technical policy documents from English into Indonesian and the challenges he encountered

The interviewee asserts that translating international documents in the field of Radiocommunication is challenging due to the abundance of technical terms that lack direct equivalents in Bahasa Indonesia. The issue is further complicated by the complex structure of source-language phrases, often in the form of dense noun-noun constructions commonly found in English. If translated literally, these phrases can result in ambiguity or misinterpretation. He mentioned the phrase "*Direktorat Infrastruktur Digital untuk Penataan Spektrum, Orbital Satelit, dan Standarisasi*." When translated into English without adequate contextual understanding, it could misleadingly suggest that "digital infrastructure" refers only to "standardization," whereas the original intent encompasses the entire scope of activities.

The interviewee made it clear that there's a significant difference in perspective between linguists and technical practitioners. A term that is grammatically correct might not be technically appropriate, and vice versa. Collaboration between translators, language experts, and technical specialists is paramount to ensure translations are accurate and contextually relevant.

The interviewee stressed the importance of understanding the context surrounding technical terms or phrases to maintain accuracy in translation. He recommended working closely with technical experts to create diagrams or architectural illustrations. For example, highly specialized terms such as adjacent

interference can be clarified through visual representation, enabling translators to gain a more comprehensive understanding before selecting an appropriate translation.

The interviewee strongly recommended using English terms in italics, especially when there are no accurate equivalents in Bahasa Indonesia. In some cases, these terms are followed by additional explanations, such as an asterisk or a footnote, to help readers understand their meaning and context.

In the translation process, the Interviewee noted that dictionaries remain one of the most important sources. These include both printed references, such as the Oxford Dictionary, and digital tools, including online translation services like Google Translate. However, he emphasized the importance of not relying solely on machine translation. Such tools often fail to capture the full context or deeper meaning of specific technical terms.

The interviewee asserts that there is a clear need for specialized tools or resources to assist in the translation of technical terminology in the telecommunications field. He proposed the creation of a standardized and consistent technical glossary as a key innovation. This glossary must be regularly updated and used collectively by translators within the same institution or community to maintain consistency over time. For example, during meetings or collaborative translation sessions, each panel is provided with a list of terms translated that day. When the same term appears again in the future, translators can refer to the list. This method ensures consistency, even when different translators are involved.

Based on the interview, the interview concluded that translating technical terms, especially in the field of radiocommunication, presents complex challenges from both linguistic and technical perspectives. Therefore, it is essential to employ strategies such as collaboration with technical experts, the use of internal glossaries, and the support of dictionaries and digital tools to ensure accurate and consistent translations. Innovations like collaborative digital glossary systems or

the use of AI-assisted translation with human oversight will offer relevant solutions in the future.

The Ministry of Communication and Digital Affairs uses its own glossary to standardize translations of technical and official documents when drafting regulations or ministerial decrees. However, the existing glossary is not yet fully organized alphabetically. Currently, it is maintained in spreadsheet form and does not include definitions for the listed terms. Based on this, the writer developed a glossary titled Telecommunications Glossary by using and adapting terms from the Ministry of Communication and Digital Affairs' existing glossary.

4.1.1.2 Planning

After conducting interviews with policy analysts from the Ministry of Communication and Digital Affairs of the Republic of Indonesia, the Telecommunication Glossary was developed as a bilingual reference in English and Indonesian. It provides clear definitions to help readers more easily understand technical terms, along with examples of how the terms are used in technical and official documents.

The development of this product took approximately two months and involved the services of a professional book designer. This collaboration helped to ensure the glossary would have a professional appearance and be visually engaging with illustrations related to telecommunications. Collaborating with a designer also enabled to focus more on content development while remaining actively involved in the layout and overall design process.

The design process was extensive, Involving ongoing discussions with team members and the academic supervisor about appropriate media and materials. The design underwent several stages of validation and feedback, including input from the supervisor and relevant institutions. Additionally, the positive feedback from users was obtained to assess the product's feasibility and usability. This feedback was essential

to ensuring that the glossary would effectively support users in translating technical and official documents.

The glossary's design was tailored to the chosen theme of telecommunications and aligned with the needs of its target audience, including policy analysts, students, and technical and non-technical professionals. The visual style was designed for readers aged 18 and older, focusing on clarity and informativeness rather than overly animated elements. The A5 size ensures that the content and illustrations are sufficiently visible and easy to read.

4.1.1.3 Development of Preliminary Form of Product

a. Material

After collecting the initial data, the glossary development process began organizing radiocommunication terms based on the glossary provided by the Ministry of Communication and Digital Affairs (MCDA). The terms were selected and categorized terms from unfamiliar to the general public but well-known to technical experts. Google Docs was used to store a list of collected terms, which allows for effective collaboration with other writers. This platform allowed designers to easily access the content and transform it into visual elements for the glossary.

The Telecommunication Glossary was developed by filtering and selecting relevant reference. The list of documents used in this phase is presented in Table 4.1. These references included publications from International Organization in Telecommunication Field, such as ITU-R, ITU-T, ITSO, IMSO. These documents are available on the official websites of each organization. However, several are classified as confidential and are only available to authorized Ministry of Communication and Digital staff. Access to these documents was granted to the researcher following the procurement of permission through a research permit letter addressed to the Head of Centre of

International Affairs at the Ministry of Communication and Digital Affairs. This authorization permitted the researcher to review and utilize the confidential materials as part of the developing the product. However, the contents of product cannot be screenshot or displayed in this report.

This process focused on selecting terms with the most recent documents directly related to radiocommunication, particularly related with space services and terrestrial services. The documents issued by Ministry of Communication and Digital Affairs were the main source for defining and verifying the meaning of technical terms. In cases where a specific term was not found in these documents, reliable technical terms were consulted to the expert of Ministry of Communication and Digital Affairs to match the accuracy and consistency in terminology usage. However, Documents are used in the glossary as follows:

Table 4. 1 List of Documents Used in the Glossary

No.	Document Title	Code	Publisher
1.	Radio Regulation, 2024	ITU-RR 24	ITU-R
2.	World Radiocommunication Conference, 2023	ITU-WRC23	ITU-R
3.	Glossary and Definitions of Time and Frequency Terms, 2013	ITU-R TF.686-3	ITU-R
4.	Quality Of Service Regulation Manual, 2017	ITU	ITU
5.	Bandwidth Measurement at Monitoring Stations, 2007	ITU-R SM.443-4	ITU-R
6.	Optimizing Terrestrial Cable Utilization Across Multiple Countries to Boost Regional and International Connectivity, 2020	ITU-T D.1040	ITU-T

7.	A Study on Recent Satellite Industry Developments: Implications for ITSO, 2024	ITSO AP-41-18E W/10/24	ITSO
8.	Global Maritime Distress and Safety System Update, 2024	IMSO A 29/6.4	IMSO
9.	Report On Long-Range Identification and Tracking Implementation and Audits, 2024	IMSO A 29/7.1	IMSO
10.	Orbital Resources-International Telecommunication Union (ITU) Regulatory Framework Review, 2024	IMSO A 29/12.1	IMSO
11.	Peraturan Menteri Komunikasi dan Informatika Republik Indonesia Nomor 10 Tahun 2022 Tentang Alokasi Spektrum Frekuensi Radio Untuk Keperluan Dinas Maritim	PERMEN No.10 Tahun 2022	MCDA
12.	Peraturan Menteri Komunikasi dan Digital Republik Indonesia Nomor 3 Tahun 2025 Tentang Penggunaan Spektrum Frekuensi Radio Untuk Dinas Satelit dan Orbit Satelit	PERMEN No.3 Tahun 2025	MCDA

Together with group members, a total of 225 terms were compiled and divided them into three sectors: Radiocommunication, Standardization, and Development. The Radiocommunication section contained 75 terms arranged alphabetically from A to Z, excluding Y because no relevant terms were found beginning with that letter.

ENTRY LIST FOR TELECOMMUNICATION GLOSSARY

No.	Source Language (EN)	Target Language (IDN)	Kode (R/S/D)	Definisi B.ind & B.ing	Contoh Kalimat
A					
1.	Autonomous Maritime Radio Services (AMRD)	Perangkat Radio Maritim Otonom	R		
2.	Aircraft Earth Station	Stasiun Bumi Pesawat Udara	R		
3.	Access network	Jaringan akses terakhir (ke pelanggan)	D		
4.	Adaptive systems	Sistem penyesuaian otomatis	D		
5.	Aeronautical mobile	Komunikasi bergerak udara	R		
6.	Artificial Intelligence	Kecerdasan buatan	S		
7.	Antenna gain	Penguatan antenna	S		
8.	Assembly		D		

Figure 4. 1 Entry List of Telecommunication Terms

After collecting the terms, definitions for each term were searched for accurate definitions. These definitions were sourced from ITU-Radiocommunication (ITU-R) and ITU-Standardization (ITU-T) regulations, as well as ministerial regulations issued by the Ministry of Communication and Digital Affairs. If a definition was found in English, it translated it into Indonesian. Conversely, when a definition was found in Indonesian and translated it into English. This step ensures that each term has an accurate definition consistent with official sources and a clear explanation that general readers, who may not be familiar with telecommunications, can easily understand.

After finishing the definition section, example sentences were searched for and compiled from publications issued by organizations related to telecommunications, such as the International Telecommunication Union, the International Maritime Satellite Organization, and the International Telecommunication Satellite Organization. These publications are publicly accessible through the organizations' official websites. This example was considered important to include in the glossary because the contexts discussed are closely related to the organizations' regulations and standards. This glossary

glossary includes example sentences to help clarify the precise meaning of technical terms within real-world usage.

21.	Harmful Interference	Interferensi yang merugikan	R	any radio frequency interference that disrupts or degrades the performance of a satellite communication system, potentially endangering safety services or seriously affecting the quality of service. setiap Interferensi frekuensi radio yang mengacaukan atau menurunkan kinerja sistem komunikasi satelit, yang berpotensi membahayakan dinas keselamatan atau secara serius mempengaruhi kualitas dinas.	...the stations of the broadcasting service shall not cause **harmful interference** to, or claim protection from, existing or planned fixed and mobile stations in the neighbouring countries ...stasiun dinas siaran tidak boleh menimbulkan **Interferensi yang merugikan** terhadap, atau meminta perlindungan dari, stasiun tetap dan bergerak yang sudah ada atau yang direncanakan di negara-negara tetangga. Source ITU-R WRC23 Final Acts
22.	Hemisphere	Belahan Bumi	R	a half of the celestial sphere as divided into two halves by the horizon; a half of a spherical or roughly spherical body (such as a planet) setengah bagian dari bola langit yang dibagi oleh garis horizon; atau setengah bagian dari benda berbentuk bulat atau hampir bulat seperti planet.	...a non geostationary satellite system simultaneously transmitting on a co-frequency basis in the fixed-satellite service in the Northern **Hemisphere.** ...Sistem satelit non-geostasioner yang secara bersamaan memancarkan pada basis frekuensi bersama dalam dinas satelit tetap di **Belahan Bumi** Utara. Source ITU-R WRC23 Final Acts
23.	High-altitude Platform Station (HAPS)	Stasiun-stasiun Platform Tinggi	R	radio stations located on an object at an altitude of 20-50 kilometres and at a specified, nominal, fixed point relative to the Earth.	The allocation to the fixed service in the frequency band 38-39.5 GHz is identified for worldwide use by administrations wishing to

Figure 4. 2 Definition and Example of Telecommunication Terms

b. Media

The collaboration with a designer was enhanced to create visual representations for the Telecommunication Glossary Product. After gathering all the terms, definitions, and example sentences with sources, the content was submitted to the designer to start the layout and design process. This step was taken in response to feedback from previous interviewees who emphasized the need for a resource that is content-rich, professionally designed, and user-friendly.

The writer remained actively involved during this phase, overseeing the design and providing feedback. This included selecting visual elements that align with the telecommunications theme, arranging the layout, choosing appropriate fonts, and placing illustrations that enhance understanding of the terms. The chosen design approach is informative and professional. It intentionally avoids excessive use of animated elements to ensure the focus remains on the content itself.

The Telecommunications Glossary is not just a standard reference text; it is also a reliable translation aid recognized for its accuracy. It aims to bridge gaps in technical understanding, especially in radiocommunication, and support the quality and effectiveness of technical and official translation processes.

1. Front Cover

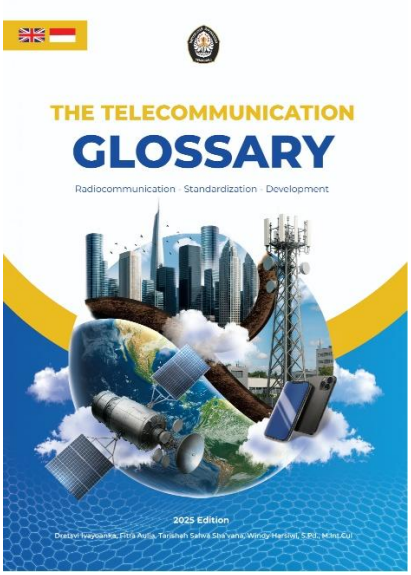

Figure 4. 3 Front Cover of Glossary

The writer recognized the need for a visual representation that could reflect the book's content. The writer used the Montserrat font in three different styles on the front cover: Use Montserrat Light, Montserrat Semi Bold, and Montserrat Extra Bold. The cover features the flags of the United Kingdom and Indonesia, clearly indicating that the glossary contains both English and Indonesian content. The university logo at the top center indicates that this product was developed by students of Diponegoro University. The university logo must be used in accordance with the formal requirements.

The front cover also includes several text elements that convey key information about the Telecommunication Glossary. The phrase "The

Telecommunication" is written in yellow to create a warm and bright impression, and is kept in a smaller font size to avoid drawing too much attention. The book's main focus is telecommunications, as the term "Glossary" makes clear. Beneath that, the words "Radiocommunication Standardization Development" are displayed. These words indicate the three main sectors covered in the glossary and show how the glossary is organized. The writer also added "2025 Edition" to indicate that the glossary was created in the year 2025. The writers' names are included at the bottom so that readers can identify the individuals who compiled the glossary.

The cover must IIe a visual element that captures the reader's attention, which is illustration. It has been developed as a visual aid to clearly convey the contents of the glossary. It takes the form of a circular graphic divided into three segments, representing the idea that telecommunication consists of three main sectors: Radiocommunication, Standardization, and Development. One part of the illustration shows a satellite orbiting the Earth along with cloud imagery. These elements symbolize the glossary content's inclusion of the radiocommunication sector. Another segment clearly shows a network transmitter and a mobile phone, indicating that the glossary also covers the standardization sector. The final part displays high-rise buildings, which represent the development sector in telecommunications.

2. Back Cover

Figure 4. 4 Back Cover of Glossary

A synopsis, which provides a general overview of the contents, is an integral component of most books. The Glossary for Telecommunication Glossary is no exception. This glossary continues to utilize the primary typeface, Montserrat. The cover includes the title of the book, a synopsis, and an engaging illustration. The color scheme is kept as clean as possible to ensure minimal distraction on the synopsis itself.

The synopsis commences with an exposition of the underlying main objective for the Glossary for Telecommunication Glossary's development. The objective of this compendium is to furnish a bilingual terminology reference that is precise, standardized, and user-friendly in the context of translating technical documents in the main three sectors: The subject of this investigation is radiocommunication, standardization, and development.

The subsequent paragraph delineates the contents of the book, which encompass a comprehensive collection of terms accompanied by their definitions, language equivalents, sources, and usage examples. These are presented in a systematic manner and supported by additional features such as a professional visual design, clean layout, consistent and readable font, and graphic elements that enhance understanding of technical concepts. The final paragraph outlines the potential applications of the glossary. It has been developed for two main purposes: first, to function as a translation aid for government institutions, and second, to serve as an academic and professional reference. Second, to ensure consistency in terminology across various English and Indonesian documents related to telecommunication.

3. Color Pallete

Figure 4. 5 Color Pallete of Glossary

The writer used a color palette that combines shades of blue and yellow. These colors were chosen to represent the field of telecommunication. The selected color palette reflects the identity of the institution responsible for policymaking in the area of radiocommunication in Indonesia, namely the Ministry of Communication and Digital Affairs. The blue color conveys modernity, futurism, and reliability, establishing the book's credibility and authority. The yellow tone brings a bright, energetic, and attention-grabbing character that creates a strong visual contrast with the dominant blue. This combination enhances the book's visual appeal and supports the effective delivery of its message.

4. Font

Figure 4. 6 Monserrat as Main font in Glossary Design Layout

The Glossary for Telecommunication Glossary uses Montserrat as its main font of Glossary. This choice was made based on considerations of readability and professional visual appearance. Montserrat is a clean, modern, and highly legible sans-serif font. It is well-suited for use in technical documents and formal publications. Montserrat's bold yet aesthetically pleasing letterforms make it clear that the book is both rich in content and presented with a visually appealing and accessible design for a wide range of readers.

5. Layout

Figure 4. 7 Main Content of Glossary Layout

The Glossary for Telecommunication Glossary's visual design is developed with a focus on readability, consistency, and professionalism. The layout is characterized by its clean, well-structured design, which is responsive to user needs across both print and digital formats. The elements of design, such as color usage, typography choices, and information organization systems, are meticulously selected to facilitate users' facile differentiation between terms, definitions, usage examples, and reference sources. The background colors are strategically varied to group information effectively, while the incorporation of initial-letter icons serves to reinforce alphabetical navigation throughout the glossary. This design approach enhances the visual appeal and serves as a functional guide that enables readers to comprehend content more quickly and efficiently.

The layout of glossary pages, for example, the entry for “Spectrum,” a clearly and systematic structure. The main term is printed in bold at the top of the page, followed immediately by its Indonesian equivalent. Definitions are presented in both English and Indonesian. The section containing example usage is designated with a unique label (Example) and is set apart by a softer background color, ensuring its immediate recognition without causing disruption to the reader. Reference sources are strategically placed at the bottom of the page in a smaller yet legible font, thereby underscoring the paramount importance of information validity. The strategic placement and separation of these elements are intended to enhance the user experience by facilitating expeditious access to terms and their technical contexts, a benefit that is particularly relevant for students, policy analysts, and professionals who require clarity in a limited timeframe.

The layout of the page for "Space weather" Incorporates supplementary visual elements, including contextual illustrations, to facilitate conceptual understanding. The following image illustrates the interaction between the sun, Earth, and technological devices, thereby visually elucidating the impact of space weather phenomena on communication systems and technology. This visual enhancement enriches the page’s appearance and helps readers understand abstract technical terms. The layout supports a more intuitive learning experience by combining definitions, examples, and illustrations. The soft blue background and organized structure ensure readability, making the glossary both informative and accessible.

4.1.1.4 Preliminary Field Testing

The validation of developed product was conducted by involving an expert from the Ministry of Communication and Digital Affairs Head of Resources and Emerging Technologies Subdivision Mr. Sri Sunardi and a supervisor from the Applied Foreign Language Program at Diponegoro University, Ms. Windy Harsiwi, S.Pd.,

M.Int.Cul. The validation process utilized a Form of Validation Sheet, which was comprised of two sections, such as Material and Media in Appendix 3

The material validation from both experts confirmed the Telecommunication Glossary's relevance to the telecommunication field, its suitability for the Ministry's translation needs, and the clarity, accuracy, and consistency of its definition and example with national and international standards. Both validators agreed that the format and structured presentation made the glossary a reliable translation reference, while preventing potential meaning errors. However, they recommended some revisions to enhance its quality, including adjusting Indonesian equivalents, such as Land Mobile Station, Artificial Intelligence, and Cyber Drill. Based on that, Therefore, based on the results of the Material Validation Sheet, the product is considered feasible for user testing, with minor revisions

The media validation process both confirmed that the book is visually appealing, well-structured, and highly readable. It has appropriate color pallets, typography, images, and a printed format is suitable. The revision notes clearly outlined specific changes to be made. Font sizes should be revised to ensure not too small when printed. Additional images should be incorporated to support certain terms. It is essential to ensure consistent use of italics for English sentences. The first validator, Sri Sunardi, gave consistently high ratings without further comments, deeming the glossary fully feasible for trial. The second validator, Windy Harsiwi, S.Pd. M.Int.Cul., agreed with the positive ratings but offered constructive suggestions. These included enlarging font sizes for both terms and definitions, adding visual aids for terms lacking them, removing unnecessary ribbon elements, and including author biographies at the end of the book. The glossary was ready for trial, as both experts agreed. These targeted revisions should be implemented to optimize usability and presentation.

4.1.1.5 Main Field Revision

In the Material Validation Sheet, both the supervisor and the expert evaluated the content of the Glossary for Telecommunication Glossary developed by the author. The assessment provided insights into the content quality and language use, thereby determining the suitability of the product for trial with users, specifically staff and interns at the Ministry of Communication and Digital Affairs. The material presented in the Glossary was found to be highly relevant to the field of telecommunications and appropriate for the translation needs of the Ministry. The English–Indonesian equivalents provided in the Glossary were considered accurate and consistent, helping to minimize meaning errors, particularly in unclear or ambiguous terms. The revision notes addressed two main issues: first, the need for greater consistency in punctuation; and second, the necessity of adjustments to the Meaning of Terms section. Therefore, based on the results of the Material Validation Sheet, the product is considered feasible for user testing, with minor revisions.

Figure 4. 8 Sample of Terms Before and After Material Revision

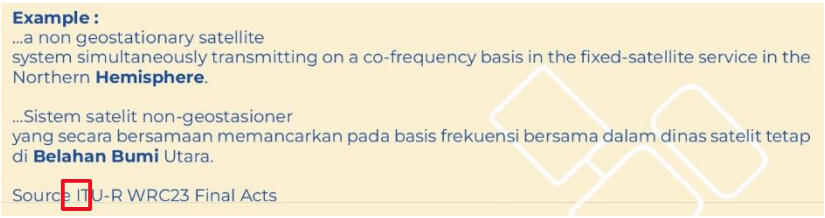

Figure 4. 9 Sample of Inconsistent Source Punctuation Before Validation

Figure 4. 10 Sample of Inconsistent Source Punctuation After Validation

In the Media Validation Sheet, both the supervisor and the expert evaluated the design and layout of the Glossary for Telecommunication Glossary developed by the author. The assessment provided insights into the content presentation and formatting layout, determining the suitability of the product for user testing, specifically with staff and interns at the Ministry of Communication and Digital Affairs. Several revision notes were distributed, emphasizing the necessity of revising the font sizes in specific sections of the document, which appeared too small when printed. The notes also highlighted the importance of incorporating images to support particular terms and the requirement of consistent use of italics for English sentences. Therefore, based on the results of the Media Validation Sheet, the product is considered feasible for user testing, with the suggested revisions.

Figure 4. 11 Sample of Font Size Before and After Validation

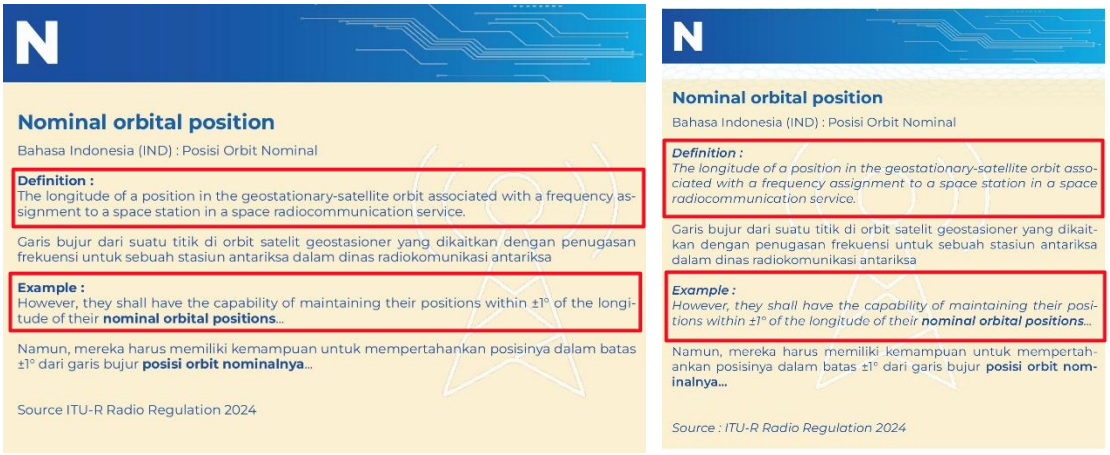

Figure 4. 12 Sample of Italic on English Sentences Before and After Validation

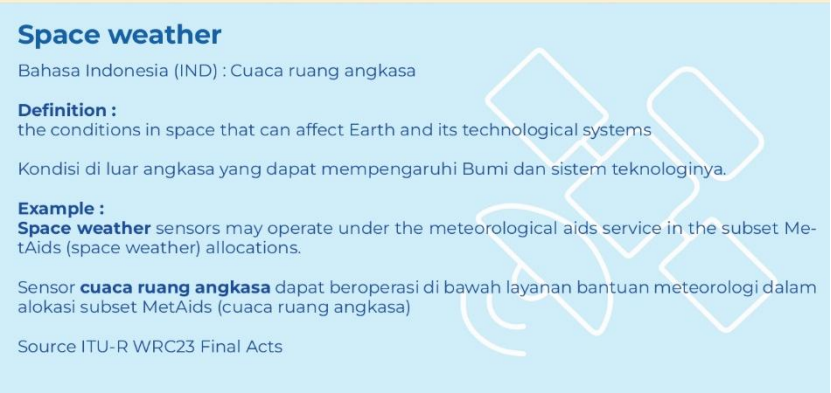

Figure 4. 13 Sample of Images Before Validation

Figure 4. 14 Sample of Images After Validation

4.1.1.6 Main Product Testing

Following the reception and review of revisions from two distinct professionals, the Glossary was printed in the A5 size. The printed copy was delivered directly to the Head of the Resources and Emerging Technologies Subdivision for distribution to users, specifically Policy Analysts and Student Interns at the Ministry of Communication and Digital Affairs, for the purpose of conducting the main field testing. This handover was part of the main field-testing process, which was designed to obtain direct feedback

from users concerning the content validity, design, and practical utility of the developed Glossary.

Following to the distribution, users, such as policy analysts and student interns at the ministry of communication and digital were requested to complete a questionnaire via Google Form. The selected respondents included the Head of the Resources and Emerging Technologies Subdivision, Policy Analysts, Technical Policy Analysts, Cooperation Document Staff, and Student Interns. They were selected on the basis that the Glossary was developed as a translation aid for both technical and official documents, which generally necessitate a high degree of consistency. Their feedback is expected to contribute to further research and development of the Glossary.

Table 4. 2 List of Respondents

Company	**Division**	**Occupation**	**Number of Respondents**
Ministry of Communication and Digital Republic of Indonesia	Centre for International Affairs	Head of Resources and Emerging Technologies Subdivision	1
		Policy Analysts	5
		Technical Policy Analysts	2
		Cooperation Materials Staff	2
		Administrative Staff	1

	Student Intern	3
Total Respondents		14

The questionnaire data from the field testing shows very strong positive responses across all evaluation areas. Each statement received an average score above 3.5, placing every item in the "Strongly Agree" category. This suggests that users found the glossary to be highly relevant, practical, and well-designed. The average scores from 20 statement items are shown as follows:

Table 4. 3 Result of Main Product Testing Questionnaire

No	Statements	Average	Interval
Q1.	This glossary is relevant to the field of telecommunication, particularly in the sectors of Radiocommunication, Standardization, and Development	3.71	Strongly Agree
Q2.	The selected terms in this glossary match the translation needs within the Ministry	3.64	Strongly Agree
Q3.	This glossary adheres to terminology standards recognized at the national and international levels	3.64	Strongly Agree
Q4.	This glossary's definitions are written in clear and understandable language for both general users and professionals	3.57	Strongly Agree
Q5.	The definitions are accurate and align with the actual meaning of the terms in	3.71	Strongly Agree

	the context of telecommunication, particularly in radiocommunication, standardization, and development		
Q6.	This glossary provides equivalent terms in both English and Indonesian in a consistent and balanced manner	3.57	Strongly Agree
Q7.	The Indonesian translations are appropriate and contextually accurate for technical and official documents	3.64	Strongly Agree
Q8.	The language used in this glossary is effective and efficient for translation purposes	3.57	Strongly Agree
Q9.	The terminology and definitions are consistently written and follow international terminology writing conventions	3.92	Strongly Agree
Q10.	This glossary successfully avoids potential meaning errors caused by unclear or ambiguous terms	3.71	Strongly Agree
Q11.	The glossary's design is suitable for official or institutional use	3.71	Strongly Agree
Q12.	The layout of the elements in this glossary makes the content easy to read and understand	3.64	Strongly Agree

Q13.	The color choices in this glossary are clear, comfortable for the eyes, and not distracting to readers	3.79	Strongly Agree
Q14.	The font type and text size in this glossary make it easy to read and remain consistent throughout the pages	3.64	Strongly Agree
Q15.	This glossary's appearance is effective and comfortable to read in both digital and printed formats	3.71	Strongly Agree
Q16.	The glossary's images and symbols definitively clarify the technical terms.	3.64	Strongly Agree
Q17.	The cover of the glossary represents the content and identity of the product well	3.71	Strongly Agree
Q18	The glossary's compact and portable size and format make it suitable for printing	3.64	Strongly Agree
Q19.	The glossary's design and layout make it a reliable professional reference in the telecommunications field	3.64	Strongly Agree
Q20.	This glossary is a media product that is feasible to use and distribute to relevant institutions or stakeholders	3.92	Strongly Agree

The highest score was given to the final item in Q9 and Q20 in average total score 3,92. it means reflecting the overall perception that the product is not only

functional but also ready for institutional adoption. In Q9, which addresses adherence to international terminology conventions indicating that the glossary is trusted as a reference that aligns with international standards. Statements related to terminology accuracy and translation effectiveness in Statements 2, 5, 7, 8, and 10 consistently scored above 3.5, confirming that the content effectively meets the real translation needs of government staff working with official and technical documents. The visual and design aspects in Statements 12 to 17 were also rated highly, with particular appreciation for the clarity of layout, readability of font, and the images relevance of the glossary cover, highlighting the success of the collaboration between content creators and graphic designers in producing a visually appealing and professional product. Notably, no item received ratings in the Agree or Disagree range, which demonstrates consistently high levels of user satisfaction across all evaluation criteria.

4.1.1.7 Final Product Revision

After the main field testing, the Glossary for Telecommunication Glossary was reviewed based on user feedback submitted through the questionnaire. The glossary results are given in the form of a link that can be accessed by anyone who opens the link via Google Drive. In filling out Google Form, there are some comments on that which are some respondents make a good comment but also, they provide suggestion based on the glossary. The suggestion is to look over the inconsistent of bold terms in example, particularly in Aircraft Earth Station and Incident Wave part. Based on that, the result of filling out questionnaire stated that glossary need to be minor revised that show on the below, but overall based on material it satisfies the audience.

Figure 4. 15 Sample of Bold Inconsistent Before and After Feedback User

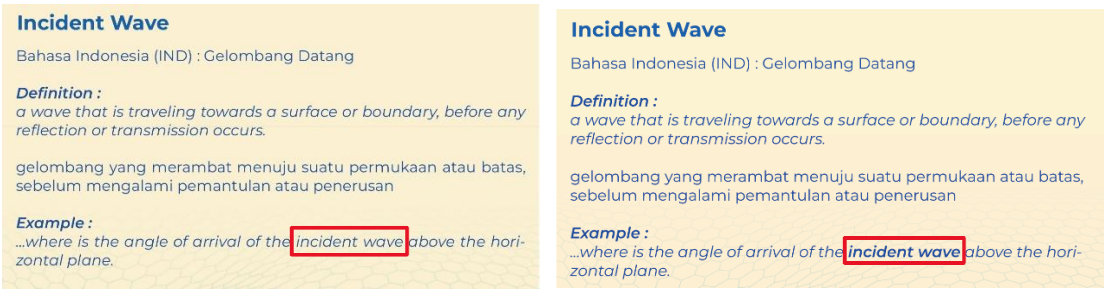

Figure 4. 16 Sample of Bold Inconsistent Before and After Feedback User

4.1.1.8 Dissemination and Implementation

After a thorough process involving multiple stages in the development of the Glossary for Telecommunication Glossary, the product was officially registered for copyright protection through the website hakcipta.dgip.go.id. However, the glossary product gained formal recognition as a legally registered and protected written work once the official copyright certificate was issued. On 16 July 2025, The Glossary for Telecommunication Glossary submitted to the Ministry of Communication and Digital Affairs at the Centre of International Affairs Office. This submission directly supports the ministry's needs in translating and understanding terminology found in telecommunication documents, both in national and international contexts. The product will serve as a main reference for internal translators, technical staff, and policy analysts involved in drafting or reviewing technical and official documents. The glossary provided to the library of the Ministry of Communication and Digital Affairs

to support students and professionals. This is part of a broader effort to ensure access to reliable reference materials.

4.2 Discussion

The development of the Telecommunication Glossary is aligned with Newmark's (1988) theory of Technical Translation, which emphasizes the importance of specialized terminology in technical texts. Although these terms typically make up only around 5–10% of the overall content, they carry significant meaning and require precise translation. This was reflected in the writer's findings during the process of identifying sample sentences in technical documents, where even a single sentence often contained multiple specialized terms. These terms needed to be translated accurately from the source language (English) into the target language (Indonesian) to preserve both meaning and context.

Newmark (1988) also highlighted the importance of recognizing common terms in translation. This implies that the glossary compiled in this glossary must be consistent with the house style of the target institution, especially in relation to technical reports and policy documents. In this project, the writer consulted various official sources such as ITU, ITSO, and IMSO to ensure that the examples and definitions used in the glossary were accurate and contextually relevant. These references allowed the glossary to serve not only as a bilingual dictionary but also as a contextual guide for translators working in high-stakes environments like international negotiations or regulation drafting.

In addition to Newmark's (1988) theory, the creation of the glossary is also supported by Glossography theory introduced by Tarp and Gouws (2023), which stems from the field of applied lexicography. According to them, glossography is the process of selecting and embedding terminology into meaningful text and compiling it into a structured glossary. This theoretical foundation supports the glossary's development process, where the writer collected, defined, and categorized telecommunication terms,

particularly in the Radiocommunication sector and presented them in a systematic and accessible format.

Chronologically, the discussion began with research and data collection. Interviews with policy analysts revealed key translation challenges in the field, especially for those without technical backgrounds. Many expressed the need for a tool that could bridge the gap between technical accuracy and linguistic clarity. This insight confirmed the urgency for a glossary that could help translators, analysts, and interns better understand and communicate technical terms. These studies showed that expert involvement, systematic validation, and appropriate printed format are necessary to produce accurate, relevant, and user-friendly glossaries for their target users

In the planning stage, the writing process began with drafting a bilingual glossary, which was designed to provide clear definitions and usage examples. Collaboration with a professional designer ensured the product would not only be content-rich but also visually accessible for its target users, such as policy analysts, interns, and professionals in the field of communication and digital affairs.

Moving to product development, terms were collected and categorized, particularly in the Radiocommunication section. Definitions were sourced from authoritative bodies like ITU-R and ITU-T and then translated into both English and Indonesian. The inclusion of real example sentences helped clarify meaning within context, following Newmark's principle of context-sensitive translation. Visual elements and illustrations were integrated to support comprehension of abstract or technical terms.

During the product validation phase, both content and media aspects were reviewed by subject experts and academic supervisors. They provided feedback on accuracy, formatting, and readability. Minor revisions were made, including adjustments in punctuation, font size, image placement, and the use of italics for

English terms. It also aligning with Newmark's emphasis on clarity and consistency in technical language.

The main field testing involved real users, such as policy analysts, technical staff, and interns at Ministry of Communication and Digital, who evaluated the glossary using a Likert scale. The results were overwhelmingly positive, with all evaluation criteria scoring in the “Strongly Agree” range. Users found the glossary relevant, clear, visually effective, and highly usable as a translation support tool. This feedback confirmed that the product was suitable for institutional use.

Based on this user feedback, final revisions were made to improve formatting consistency. Once finalized, the glossary underwent copyright registration and dissemination. It was formally submitted to the Ministry of Communication and Digital Affairs and made available to their internal library, ensuring it would continue serving as a practical reference for current and future translators and policy professionals. By integrating expert input, institutional requirements, and theoretical principles, the Telecommunication Glossary serves as a valuable tool for improving translation quality, consistency, and comprehension in technical communication.

The results of this study were aligned with previous studies rather than contradicted it. Similar to the Business Administration and Accounting e-glossary developed by Rohani and Suyono (2021), the Telecommunication Glossary implemented strategies of presenting bilingual terms with definitions and example sentences, specifically in radiocommunication terms based on international organization of telecommunication documents and ministry of communication and digital affairs documents. It also reflected the approaches used in Maculan, Mesquita, and Falcão's (2023) study on Knowledge Organization Systems, which emphasized collecting terms from credible sources for radiocommunication terms, the standardization of definitions, and ensuring accessibility. The validation process followed a similar approach to the one used by Widianti, Amilia, and Vardan's slang dictionary (2024), but it involved the input of material and media experts from the

Ministry of Communication and Digital Affairs and Applied Foreign Language Diponegoro University to ensure technical standards. This study was differentiated from previous works by its adoption of a printed glossary format, which is uncommon in the development of telecommunication glossaries. This format provided clear, accessible references for institutional use, featured definitions, example sentences, and illustrative images, and was designed for future updates to address the evolving nature of telecommunication terminology. Overall, the study confirmed and expanded upon established methods, adapting them to the specialized domain of telecommunications.