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International Journal of Artificial Intelligence Research

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International Journal of Artificial Intelligence Research (IJAIR) is a peer-reviewed open-access journal. The journal invites scientists and engineers throughout the world to exchange and disseminate theoretical and practice-oriented the whole spectrum of Artificial intelligence. The scope includes, but is not limited to, Machine Learning & Soft Computing, Data Mining & Big Data Analytics, Computer Vision & Pattern Recognition, and Natural language processing. Submitted papers must be written in English for the minimum requirements of the initial review stage by editors and a further review process by a minimum of three reviewers.

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please register via this link : shorturl.at/jBLZ3

Posted: 2020-10-15

International Journal Of Artificial Intelligence Research (IJAIR) Accredited Rank 2 (Peringkat 2)

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We proudly announce that **International Journal Of Artificial Intelligence Research (IJAIR)** is **Accredited "Rank 2"** (Peringkat 2) as a scientific journal under the decree of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia, Decree No **10/E/KPT/2019, April 04th 2019**

Therefore, we would like to invite you to contribute to **International Journal Of Artificial Intelligence Research (IJAIR)** as a helpful research open source by sending highly qualified paper.



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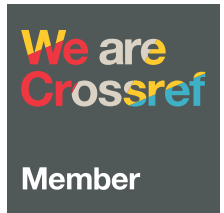
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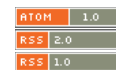
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Focus and Scope

The Journal covers the whole spectrum of intelligent informatics, which includes, but is not limited to :

- Artificial Immune Systems, Ant Colonies, and Swarm Intelligence
 - Autonomous Agents and Multi-Agent Systems
 - Bayesian Networks and Probabilistic Reasoning
 - Biologically Inspired Intelligence
 - Brain-Computer Interfacing
 - Business Intelligence
 - Chaos theory and intelligent control systems
 - Clustering and Data Analysis
 - Complex Systems and Applications
 - Computational Intelligence and Soft Computing
 - Cognitive systems
 - Distributed Intelligent Systems
 - Database Management and Information Retrieval
 - Evolutionary computation and DNA/cellular/molecular computing
 - Expert Systems
 - Fault detection, fault analysis and diagnostics
 - Fusion of Neural Networks and Fuzzy Systems
 - Green and Renewable Energy Systems
 - Human Interface, Human-Computer Interaction, Human Information Processing
 - Hybrid and Distributed Algorithms
 - High Performance Computing
 - Information storage, security, integrity, privacy and trust
 - Image and Speech Signal Processing
 - Knowledge Based Systems, Knowledge Networks
 - Knowledge discovery and ontology engineering
 - Machine Learning, Reinforcement Learning
 - Memetic Computing
 - Multimedia and Applications
 - Networked Control Systems
 - Neural Networks and Applications
 - Natural Language Processing
 - Optimization and Decision Making
 - Pattern Classification, Recognition, speech recognition and synthesis
 - Robotic Intelligence
 - Rough sets and granular computing
 - Robustness Analysis
 - Self-Organizing Systems
 - Social Intelligence
 - Soft computing in P2P, Grid, Cloud and Internet Computing Technologies
 - Stochastic systems
 - Support Vector Machines
 - Ubiquitous, grid and high performance computing
 - Virtual Reality in Engineering Applications
 - Web and mobile Intelligence, and Big Data
- Digital Marketing
 - CRM (Customer Relationship Management)
 - Financial Technology
 - Digital Distribution Channel
 - Digital Consumer Behavior

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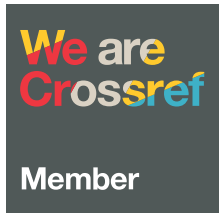
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Peer Review Process

Peer Review Process

1. Editors first review the submitted manuscript, called **initial review by the editors**. It will be desk evaluated whether the submitted manuscript is **suitable** for the International Journal of Artificial Intelligence Research based on **focus and scope**, similarity score by using Crosscheck-iThenticate, **methodological flaw**, **readability of the articles**, and adhering to **the submitted paper template**.
2. Furthermore, the manuscript will be sent to at **least three anonymous reviewers (Double-Blind Peer-Review)**.
3. The anonymous reviewers' comments are then sent to the corresponding author for necessary actions and responses. Afterward, the editorial team meeting suggested the final decision to the revised manuscript by authors.
4. Finally, the Editor will send the final decision to the corresponding author.
5. The accepted manuscript then continued to the copyediting and layout editing process to prepare the camera-ready paper.

Review Outcomes

Utilizing feedback from the peer review process, the Editor will make a final publication decision. **The review process will take approximately 4 to 12 weeks.** Decisions categories include:

- **Reject** - Rejected manuscripts will not be published, and authors will not have the opportunity to resubmit a revised version of the manuscript to International Journal of Artificial Intelligence Research.
- **Resubmit for Review** - The submission needs to be re-worked, but with significant changes, it may be accepted. However, It will require a second round of review.
- **Accept with Revisions** - Manuscripts receiving an accept-pending-revisions decision will be published in International Journal of Artificial Intelligence Research under the condition that **Minor** or **Major** modifications are made. Revisions will be reviewed by an editorial team to ensure necessary updates are made prior to publication.
- **Accept** - Accepted manuscripts will be published in the current form, with no further modifications required.

Correspondence

All correspondence concerning manuscripts should be directed to the Editor of International Journal of Artificial Intelligence Research and cc to **info@ijair.id**. The Editor will direct all correspondence to the lead author; the lead author is responsible for sharing communications with other authors. Beyond communication concerning the review, manuscripts accepted for publication may require additional correspondence to complete copyediting and layout editing.

[Update on August 4, 2021]

Publication Frequency

This journal is published two times a year (June, December)

Open Access Policy



The International Journal of Artificial Intelligence Research holds the principle that all research is for the benefit of mankind. Research is a product of investment by society and therefore the results must be returned to all without borders or discrimination, serving society in a universal and transparent manner. That is why the International Journal of Artificial Intelligence Research provides free and open online access to all of its research publications. All articles that are accepted will be available immediately and free to download on the <https://ijair.id/index.php/ijair/index> page without limits and at no cost.

The International Journal of Artificial Intelligence Research understands that in this world everyone has an equal opportunity to seek, share and create knowledge - we hope the authors join us in this open access concept.

Archiving



This journal utilizes the LOCKSS system to create a distributed archiving system among participating libraries and permits those libraries to create permanent archives of the journal for purposes of preservation and restoration. [More...](#)

Publication Ethics and Malpractice Statement

International Journal of Artificial Intelligence Research, called IJAIR, is committed to upholding the highest standards of publication ethics and takes all possible measures against any publication malpractices. The Editorial Board is responsible for, among others, preventing publication malpractice. Unethical behavior is unacceptable, and the IJAIR does not tolerate plagiarism in any form. Authors who submitted articles: affirm that manuscript contents are original. Furthermore, the authors' submission also implies that the manuscript has not been published previously in any language, either wholly or partly, and is not currently submitted for publication elsewhere. Editors, authors, and reviewers, within the International Journal of Artificial Intelligence Research, are to be fully committed to good publication practice and accept the responsibility for fulfilling the following duties and responsibilities, as set by the COPE Code of Conduct for Journal Editors. As part of the Core Practices, COPE has written guidelines on the <http://publicationethics.org/resources/guidelines>.

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3. The factors that are taken into account in review are relevance, soundness, significance, originality, readability, and language.
4. The possible decisions include acceptance, acceptance with revisions, or rejection.
5. If authors are encouraged to revise and resubmit a submission, there is no guarantee that the revised submission will be accepted.
6. Rejected articles will not be re-reviewed.
7. The paper acceptance is constrained by such legal requirements as shall then be in force regarding libel, copyright infringement, and plagiarism.
8. No research can be included in more than one publication.

Section B: Authors' responsibilities

1. Authors must certify that their manuscripts are their original work.
2. Authors must certify that the manuscript has not previously been published elsewhere.
3. Authors must certify that the manuscript is not currently being considered for publication elsewhere.
4. The authors must participate in the peer-review process.
5. Authors are obliged to provide retractions or corrections of mistakes.
6. All Authors mentioned in the paper must have significantly contributed to the research.
7. The authors must state that all data in the paper are real and authentic.
8. The authors must notify the Editors of any conflicts of interest.
9. The authors must identify all sources used in the creation of their manuscript.
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Section C: Reviewers' responsibilities

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4. Reviewers should identify relevant published work that has not been cited by the authors.
5. Reviewers should also call to the Editor in Chief's attention any substantial similarity or overlap between the manuscript under consideration and any other published paper of which they have personal knowledge.
6. Reviewers should not review manuscripts in which they have conflicts of interest resulting from competitive, collaborative, or other relationships or connections with any of the authors, companies, or institutions connected to the papers.

Section D: Editors' responsibilities

1. Editors have complete responsibility and authority to reject/accept an article.
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4. Editors should guarantee the quality of the papers and the integrity of the academic record.
5. Editors should publish errata pages or make corrections when needed.
6. Editors should have a clear picture of research funding sources.
7. Editors should base their decisions solely on the papers' importance, originality, clarity, and relevance to publication's scope.
8. Editors should not reverse their decisions nor overturn the ones of previous editors without serious reason.
9. Editors should preserve the anonymity of reviewers.
10. Editors should ensure that all research material they publish conforms to internationally accepted ethical guidelines.
11. Editors should only accept a paper when reasonably certain.
12. Editors should act if they suspect misconduct, whether a paper is published or unpublished, and make all reasonable attempts to persist in obtaining a resolution to the problem.
13. Editors should not reject papers based on suspicions; they should have proof of misconduct.
14. Editors should not allow any conflicts of interest between staff, authors, reviewers, and board members.

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Papers submitted to IJAIR will be screened for plagiarism using **CrossCheck/iThenticate** plagiarism detection tools. IJAIR will immediately reject papers leading to plagiarism or self-plagiarism.

Before submitting articles to reviewers, those are first checked for similarity/plagiarism tool, by a member of the editorial team. The papers submitted to IJAIR must have a similarity level of less than 15%.

Plagiarism is the exposing of another person's thoughts or words as though they were your own, without permission, credit, or acknowledgment, or because of failing to cite the sources properly. Plagiarism can take diverse forms, from literal copying to paraphrasing the work of another. In order to properly judge whether an author has plagiarized, we emphasize the following possible situations:

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- **Paraphrasing** involves taking ideas, words or phrases from a source and crafting them into new sentences within the writing. This practice becomes unethical when the author does not properly cite or does not acknowledge the original work/author. This form of plagiarism is the more difficult form to be identified.

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Every article accepted by IJAIR use references managment softwere. eg Mendeley or zotero

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The papers published in the International Journal of Artificial Intelligence Research will be considered to retract in the publication if :

1. They have clear evidence that the findings are unreliable, either as a result of misconduct (e.g. data fabrication) or honest error (e.g. miscalculation or experimental error)
2. the findings have previously been published elsewhere without proper crossreferencing, permission or justification (i.e. cases of redundant publication)
3. it constitutes plagiarism
4. it reports unethical research

The mechanism of retraction follows the Retraction Guidelines of Committee on Publication Ethics (COPE) which can be accessed at <https://publicationethics.org/files/retraction-guidelines-cope.pdf>

Plagiarism Policy

IJAIR Editorial board recognizes that plagiarism is not acceptable and therefore establishes the following policy stating specific actions (penalties) when plagiarism is identified in an article that is submitted for publication in IJAIR.

Definition:

Plagiarism involves the "use or close imitation of the language and thoughts of another author and the representation of them as one's own original work."

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Papers must be original, unpublished, and not pending publication elsewhere. Any material taken verbatim from another source needs to be clearly identified as different from the present original text by (1) indentation, (2) use of quotation marks, and (3) identification of the source.

Any text of an amount exceeding fair use standards (herein defined as more than two or three sentences or the equivalent thereof) or any graphic material reproduced from another source requires permission from the copyright holder and, if feasible, the original author(s) and also requires identification of the source; e.g., previous publication.

When plagiarism is identified, the Editor in Chief responsible for the review of this paper and will agree on measures according to the extent of plagiarism detected in the paper in agreement with the following guidelines:

Level of Plagiarism

1. Minor: A short section of another article is plagiarized without any significant data or idea taken from the other paper

Action: A warning is given to the authors and a request to change the text and properly cite the original article is made

2. Intermediate: A significant portion of a paper is plagiarized without proper citation to the original paper

Action: The submitted article is rejected and the authors are forbidden to submit further articles for one year

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Action: The paper is rejected and the authors are forbidden to submit further articles for five years.

It is understood that all authors are responsible for the content of their submitted paper as they all sign the IJAIR Copyright Transfer Form. If a penalty is imposed for plagiarism, all authors will be subject to the same penalty.

If a second case of plagiarism by the same author(s) is identified, a decision on the measures to be enforced will be made by the Editorial board (Editor-in-Chief, and Editorial members) with the Chair of the Editor in Chief. The author(s) might be forbidden to submit further articles forever.

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The following text should be included on the first page of the submitted article when it first is posted in any of the above outlets: "***This work has been submitted to the IJAIR for possible publication***".

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2. Author's employer's website
3. arXiv.org
4. Funder's repository*

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2. The article will be followed by statements on the IJAIR copyright notice.

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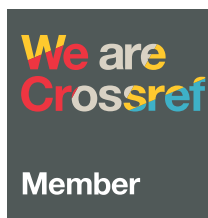
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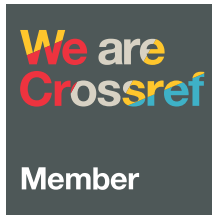
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

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Use of NVivo in Complaint Analysis About Hospital Services to Improve Customer Satisfaction

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Abstract

The development of qualitative research must balance the ability to use computers to facilitate data analysis. We created this study for this purpose. NVivo is used to analyze complaints from users at the Dharmais Cancer Hospital, Jakarta. This study is intended to collect data in the real-world context of hospitals regarding customer service through. NVivo was very helpful in processing data and analyzing various information from all informants. The customer's expectation is an integrated service, starting from the time of diagnosis to planning and preparing for continuous care that is effective and efficient, so as to save health expenses.

Keywords

NVivo, Complaint Analysis, Hospital Services, Customer Satisfaction, Dharmais Cancer Hospital

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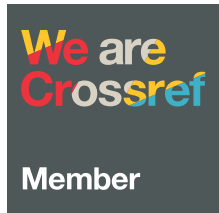
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Artificial Neural Network Artificial Neural Networks Competence of Human Resources, Infrastructure, Sources of Revenue, Accountability of Financial Statements, Performance of Financial Management. Data Mining Entrepreneurial Competence, External Factors, Small and Medium Enterprise Performance Financial Performance, Islamic Social Reporting Disclosure, Sharia Compliance, Sharia Supervisory Board Fulfilling, Minimum Essential Force, Defense Industry, Defense Budget Fuzzy C-Means Hadith Perspective Hybrid Contract Implementation, Restaurant Service Business, CHSE Program Intellectual Capital, Knowledge, Competitive Advantage MSE Machine Learning Personality, Job Satisfaction, Government, Village, BUMDes. Prediction Profitability, Liquidity, Business Risk Capital Structure Short Circuit



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Use of NVivo in Complaint Analysis About Hospital Services to Improve Customer Satisfaction

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ABSTRACT

The development of qualitative research must balance the ability to use computers to facilitate data analysis. We created this study for this purpose. NVivo is used to analyze complaints from users at the Dharmais Cancer Hospital, Jakarta. This study is intended to collect data in the real-world context of hospitals regarding customer service through. NVivo was very helpful in processing data and analyzing various information from all informants. The customer's expectation is an integrated service, starting from the time of diagnosis to planning and preparing for continuous care that is effective and efficient, so as to save health expenses.

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I. Introduction

Qualitative research has been very developed, especially with the emergence of various tools using computers. Economic research, which used to be widespread using secondary data, is now starting to use more informants as its primary source, especially in management. From 1995 to 2016, there has been a 15-fold increase in the awarding of qualitative scholarships to the social sciences [1]. This improvement has helped the development of the social humanities sciences in general. Qualitative research has brought a pluralist orientation to theory and practice, thereby inspiring much theory-building, promoting interdisciplinary collaboration, and encouraging greater minority inclusion [2][3].

Many journals publish previously reluctant qualitative studies, making qualitative research more methodologically inclusive. It encourages the development of qualitative publications to become more stringent due to dramatic increases [4], as well as the emergence of a variety of quality and systematic work [5]. The American Psychological Association (APA) has become one of the standards in reporting qualitative studies [6]. The widespread consumption, production, and standardization of this mode of qualitative research is an impetus for researchers and students [7][8]. Hopefully, this will increase, not only in quantity but also in accountability, with generally increasing standards [9][3]

There are many problems faced by qualitative researchers. The computer is a very helpful tool and one of the solutions for processing qualitative research data. Since the mid-1980s, technological changes have enabled further reach in qualitative research, starting with data analysis [10]. Nvivo is a qualitative data analysis software developed by Qualitative Solution and Research (QSR) for qualitative data. Nvivo has quite exclusive features compared to other data processing. Nvivo can organize and analyze images, video, and audio manually or automatically by coding data, which will later be in the form of theme comparison diagrams based on participant backgrounds, tree diagrams, graphs, and bibliographic annotations (Bandur, 2016)

Even though NVivo has been developed since 1981 by programmer Tom Richards, many qualitative researchers have yet to use it because this software has a high level of complexity, so operating and using it requires continuous and intense training (Priyatni et al., 2020). From this research gap, the development of qualitative research must be balanced with the ability to use computers as a tool to facilitate data analysis, so this paper is made for that purpose. In its use for this study, NVivo will be used to analyze complaints from hospital users, especially patients at the Dharmais Cancer Hospital, Jakarta.

II. Methods

This research study is intended to collect data in the real-world context of hospitals regarding customer service through qualitative research methods.[11] point out that, "Qualitative researchers formulate open-ended questions. However, additional questions may arise during the research study." "Flexibility is very important to investigate the subject and request additional information to explore what participants are saying" [12]. This qualitative research was conducted at the Dharmais Cancer Hospital, Jalan S. Parman, West Jakarta, Indonesia. The object of this research is the hospital stakeholders, including Functional Medical Staff (SMF).

The complete research chronology is as follows:

- a) Literature review and initial observation. It aims to collect scientific data and information from theories, methods, or approaches developed and documented in books, journals, manuscripts, and notes. A literature review was conducted to discover theories regarding computer applications in qualitative research analysis, NVivo applications, and theories regarding patient satisfaction and complaint management. Observations in this study were carried out by observing directly and understanding the activities contained in the Outpatient and Inpatient Units at the Dharmais Cancer Hospital, Jakarta. Observations were also made by asking several questions about service satisfaction and complaints about hospital services. The results obtained are in the form of general information about hospital operations, the level of customer satisfaction, and data regarding complaints.
- b) Interview and Observation. Interviews in this study aim to obtain data on perceptions of satisfaction from service. Interviews were conducted with informants involved in hospital services, such as available medical staff (SMF) and patients. Observation at this stage aims to obtain supporting data to triangulate data or validate informant statements during interviews.
- c) Data reduction. Data reduction was made by transcribing the data using MsWord. The contents of the data transcription include the respondent's name, gender, type of nurse's duties, time of the interview, and contents of the conversation with the respondent. Then there is the data coding process using NVivo Software, meaning that the interview contents are classified into certain theme group codes according to the nodes used in the NVivo Software. In the analysis using NVivo Software, the data transcription results in Ms. Word are used as data processing input in the software. The output of the software is then used in the process of presenting the data.
- d) Data Presentation. At this stage, data on perceptions regarding consumer or patient complaints obtained from observations and interviews are presented according to factors, namely: customer characteristics, customer complaints, customer expectations, efforts to reduce/eliminate customer complaints, efforts to meet customer expectations, and product/ service.
- e) Conclusion Drawing. At this stage, conclusions are drawn from the data processing results using the Nvivo software and then given potential suggestions for improvement after drawing conclusions.

This study used Nvivo Software to analyze the results of interviews transcribed in MsWord form. In the data processing process with the Nvivo software, what is done is as follows "[13]:

- Transcription of interview data with MsWord
- Import interview transcripts to NVivo Software on the Source tab
- Create nodes (factors and subfactors) in the nodes tab
- Open the data transcription of each informant that has been imported.
- Mark some of the required text and drag it to the related subfactors
- When finished, select one of the factors to find out the results.

From this classification, the output is obtained. The results of data analysis in this study can be presented with Word Frequency Queries in NVivo. These Word Frequency Queries can help researchers to explore the words that appear most often (Frequency) in research data. This analysis tool allows words with the same meaning to be categorized into groups. Word Frequency Queries are effective for content or thematic text analysis (content/thematic text analysis). [14].

III. Result and Discussion

A. Use of NVIVO

The problems faced by qualitative researchers can be overcome using an application developed by QSR International, NVivo. "NVivo is a set of tools provided to manage data from a variety of different sources, for example, books, research reports, historical documents, journal articles, website content,

online news, conference proceedings, memos, field notes, bibliographic annotations, and even a researcher's daily journal. NVivo is continuously being developed to support qualitative researchers in managing data, conducting literature reviews quickly, efficiently, and effectively, and triangulating and making presentations/visualization of research results. (Priyatni et al., 2020)

NVivo stands for NUD*IST and Vivo. NUD*IST (Non-Numerical Unstructured Data Indexing Searching and Theorizing) is software for developing, supporting, and managing qualitative data analysis projects. Vivo is taken from in-vivo, a term from grounded theory research experts Strauss and Glasser, which means coding based on real, live data experienced by participants in the field. Thus, NVivo is software for developing, supporting, and managing qualitative data analysis, whose main function is to code data effectively and efficiently. Therefore, coding research data sources is the key to being able to present qualitative research data in the form of tables, graphs, or diagrams. (Priyatni et al., 2020)

The existence of NVivo is very helpful for qualitative researchers who have been faced with the biggest challenges related to subjectivity (researcher-biased), validity, and reactivity. This challenge can only be overcome if qualitative researchers rely on manual data analysis. NVivo can help qualitative researchers overcome these challenges by coding data from various sources and separating data from informants, researchers, and secondary sources (books, research reports, historical documents, journal articles, and website content), online news, conference proceedings, memos, field notes, bibliographic annotations, and even the researcher's daily journal stored in NVivo). NVivo is also effective for triangulation. NVivo also gives qualitative researchers the widest possible space to work within NVivo. (Priyatni et al., 2020)

Using NVivo will assist qualitative researchers in processing data according to the characteristics of qualitative research. Qualitative research data is non-numeric data, namely in the form of text or visuals. The variety of qualitative research data is also very abundant, both in softcopy and hardcopy. The abundance of data often makes it difficult for researchers to organize data manually. It is inefficient because it takes up many resources, such as time, money, and effort. The NVivo application helps researchers to speed up and simplify the data organization process so that data can be classified neatly. NVivo provides facilities for managing data, organizing and tracking multiple records or files of raw data from interviews, questionnaires, focus groups, or field observations. As well as published research, images, diagrams, audio, video, web pages, other documentary sources, rough notes and the ideas written down in the memo, information about the data source, and a conceptual map of what is going on in the data. (Priyatni et al., 2020)

NVivo can separate data from informants and those from researchers as well as secondary sources (books, research reports, historical documents, journal articles, website content, online news, conference proceedings, memos, field notes, bibliographic annotations, and even a researcher's daily journal stored on NVivo). Moreover, NVivo provides the widest possible space for the research team to work in NVivo. With NVivo, qualitative researchers can efficiently and effectively perform coding and analysis of data, especially qualitative data and qualitative data that has been quantified and processed in Excel and/or SPSS programs. Researchers can also present data analysis results in tables, diagrams, and graphs for thematic, content, and comparative analysis purposes and even analyze associative, one-way, and symmetrical relationships. (Priyatni et al., 2020)

Apart from being used for data analysis, NVivo can also be used for conducting literature reviews. A literature review is an important milestone that researchers must complete promptly and efficiently. Through literature review, researchers will explore several kinds of literature from various sources to support and answer the research problems that have been proposed. A literature review is one of the most difficult aspects of the research journey. Literature research with a traditional approach is certainly very tedious and time-consuming. NVivo provides tools that make it easy for researchers to conduct a literature review. NVivo helps researchers explore large volumes of textual documents to see topics and patterns by using the auto-code feature. (Priyatni et al., 2020)

With NVivo, qualitative researchers can efficiently and effectively code analytical data. Codes are short words or phrases that provide summative attributes and symbolically capture the essence of visual data [15]. Data can consist of interview transcripts, participant observation field notes, journals, documents, pictures, artifacts, photos, videos, internet sites, email correspondence, literature, and so on. The portion of data to be encoded during the first cycle of coding can range from a single word to a full paragraph to an entire page of text. In the second cycle of the coding process, the encoded part

can be the same unit. Coding (coding) is the "important link" between data collection and the explanation of its meaning [16]. Qualitatively, a code is a construct created by a researcher that represents an attribute in interpreting the meaning of each data for purposes of pattern detection, categorization, theory building, and other analytical processes. Just as the title represents and captures the main content and essence of a book, film, or poem, so does the code represent and capture the primary content and essence data. In other words, the main purpose of coding or coding is for analytical purposes [15]. (Priyatni et al., 2020)

Some research methodologists believe coding is technical work and preparation for higher-order thinking. Coding is an in-depth analysis and reflection on the data and interpretation of the meaning of the data. Codes, not exclusively used to retrieve and classify similar pieces of data, researchers can quickly find, extract, and group segments related to a particular research question, hypothesis, construct, or theme. The clustering and display of condensed chunks are then used for further analysis and conclusion [17]. (Priyatni et al., 2020)

In NVivo, "The data sources analyzed are divided into internal and external research data sources, researchers' notes during data collection (Memos), and matrix frameworks (Framework matrices). External sources are research materials that cannot be entered directly into NVivo, for example, reference books from libraries or printed journals. Memos are a source of research data in the form of researchers' notes during the data collection process or reflections made by researchers while conducting research. Framework matrices are a summary of the results of observations of certain participants and project themes made in a matrix table" [14].

B. Classifying Nodes and Data Analysis

Nodes are 'Containers' where researchers store themes, participants, research settings, and organizations. Therefore, researchers can organize themes into sub-themes into more specific topics (child nodes) [18];[14]. Attached below is the analysis of data regarding nodes in the form of chart, diagram or graph models for thematic, content, comparative analysis, and even analyzing associative, one-way, and symmetric relationships (Priyatni et al., 2020).

Researchers identify existing patterns to find answers to the problem formulation by going through the coding stages to carry out the analysis, namely [10]:

- a) Open coding, giving marks (with underlines, circles, or other markers) on words or phrases representing an important concept in a data set. The stage begins when the researcher obtains data and tests it, and each piece of data is labeled.
- b) Axial coding defines several themes/categories that accommodate some of the code made in Open Coding. It then reviews and re-highlights the common themes, regroups the initial categories in new forms to build the main categories, then labels them.
- c) Selective coding is the selection of a core category that relates it to other categories, and the researcher can find the essence of the research and combine all the elements of the emerging theory. The core categories are the most significant ideas for informants.
- d) Matrix Coding Query, "is a sub-process that is in the query analysis stage. Researchers process data with a flexible approach to understanding data with a more focused perspective and find certain data patterns by finding combinations of nodes and attributes by displaying the results in tables.
- e) A Word frequency query is used to find words or concepts often spoken in interviews with informants. At this stage, the researcher uses analysis to remind the researcher that no important issues are overlooked in the analysis and reporting process.
- f) Project Map data is the final stage and serves as a visualization tool to explore ideas and show connections between data and another. The project map will graphically represent the various items made in the research. The researcher makes an analysis map of the coding, case, and related source data to display the data process flow and the relationship between each data carried out from the beginning to the end."
- g) Framework matrices are an analysis process that is used to help summarize research data source materials and is used to explain the framework. The researcher makes a representative, which explains where the researcher can answer any existing problem formulations with data sources from informants and other supporting documents.

Visualizations can be used throughout any stage of a research project. The types of visualization available on NVivo are charts, hierarchy charts, mind maps, concept maps, project maps, comparison diagrams, explore diagrams, cluster analysis diagrams, sociograms, and so on (Prabowo, 2022)

1) *Project Map*

A project map is a way of visually exploring or presenting data in a project that will be or is being worked on. The project map is made of shapes representing the various project items and connectors showing the links between items. Doing this takes some project data before creating a project map. Project maps are used, “to explore and organize data, develop ideas, build theory and make decisions, identify emerging patterns, theories, and explanations, visually depict links between project items, and provide a record of the stages in a project”[14].



Fig. 1. Example of Text Search Queries Analysis Fig. 2. Example of Word Frequency Queries Analysis

Text Search Queries and Word Frequency Queries are the most used visualization (query) or data presentation. In text search queries, researchers can explore words contained in texts or research data sources. NVivo will display these words in a diagram to form the meaning of the word in the context of its use (see Figure 2). Word Frequency Queries have been described previously (see Figure 3). Other data visualizations are coding queries, matrix coding queries, crosstab queries, compound queries, coding comparison queries, group queries, and others (Prabowo, 2022).

C. *Case Study: Analysis of User Complaints at Dharmais Cancer Hospital Demographic Description*

The profiles of the respondents are divided into several categories, namely by gender, age, occupation, and area of residence, which can be seen in the image below:

Table 1. Distribution of Respondents

Profile	Percentage
Gender	
Man	38.89
Female	61.11
age	
17-30	25.00
31-45	37.70
56-60	29.37
>60	7.94
Occupation	
businessman	12.10
Private sector employees	27.38
government employees	7.34
Housewife	33.33
Student	7.34
Does not work	2.98
Others	9.52
Area of residence	
Bekasi	7.34
Tangerang	17.86
Bogor	7.54
Depok	4.54
Jakarta	44.05
Others	18.65

^a. Source: Data Processing, 2022

1) Customer Characteristics



The majority of Dharmais Cancer Hospital patients are BPJS Health participants. Dharmais Cancer Hospital is consistent as a national referral center hospital in the field of management (treatment and care) of cancer in Indonesia. The demographic and socio-economic conditions of Dharmais Cancer Hospital patients are very diverse.

2) Value Proposition Interview Results with Functional Medical Staff (SMF)

Following are the results of an interview with SMF through Word Frequency Queries visualization to get customer complaints, customer expectations, efforts to reduce/eliminate customer complaints, and efforts to meet customer expectations which will be explained next.



3) Customer complain



Most of the patient complaints are not about medical services but administrative services and support services such as registration, parking queues, and so on. Of the 5 (five) aspects of customer

value, namely aspects of quality, cost, time, patient safety, and service culture, the time aspect is considered the most important, and this is very prominent. The root cause of complaints about timing is that there is already a service overload.

4) Customer expectations

Dharmais Cancer Hospital customers expect complete and adequate facilities, including facilities and infrastructure, main equipment and diagnostic support, medicines, and others according to service standards. The competence and professionalism of human resources are also highly expected by patients, in addition to demands for friendliness, speed, and accuracy. Another issue that has surfaced is service integration, both manual and technology-based.

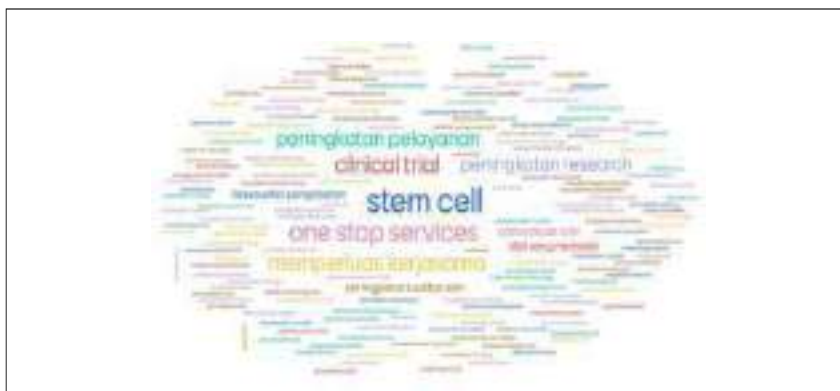


5) Efforts to reduce/eliminate customer complaints



Several available medical staff (SMF) stated that there was a need for additional skilled and trained human resources, especially for support sections. Apart from that, available medical staff also stated that adding and rejuvenating medical and non-medical equipment was necessary. The equipment must meet service standards, quality requirements, security, safety, and usability. The procurement can be done alone or in collaboration with third parties. To reduce complaints about time, some available medical staff recommend integrated services.

6) Efforts to meet customer expectations



The idea of stem cells and clinical trials emerged as a breakthrough in meeting customer expectations, especially palliative ones. At the same time, the above proposal is based on the fact that many cases of cancer at an advanced stage experience severe symptoms. Moreover, cause suffering that has not been handled properly—integrating services from the time of diagnosis to planning and preparing for ongoing treatment that is effective and efficient. It can limit health spending.

7) *Products/services*



Collaboration between disciplines is important to the principle of the multi-disciplinary team in determining service goals, screening and diagnosis, making service plans, and monitoring and follow-up. In essence, all products/services aim to improve the quality of life of cancer patients, which is the main indicator of service success

8) *Top Ten Complaints*

The following are the top ten complaints from respondents about the services of the Dharmais Cancer Hospital, which can be seen in the table below:

Table 2. Top Ten Complaints of Dharmais Hospital Services

Complaints		Number of Complaints (%)
1.	Doctors are often not on time	31.65%
2.	The toilet is dirty and smells bad	16.46%
3.	Printing machines/applications often have problems	10.13%
4.	Service procedures need to be clarified sometimes. They are transferred to other officers	7.59%
5.	Complicated procedure	6.33%
6.	There is no notification of any changes to procedures/flows/ services/new systems	6.33%
7.	There is no notification when there is a schedule change	6.33%
8.	Nurses are not friendly	5.06%
9.	Officers lack detail in explaining service procedures	5.06%
10.	The Doctor's service time is limited/less long	5.06%

^b Source: Data Processing, 2022

The top ten complaints by respondents from Dharmais Hospital services that need improvement are: Doctors are often not on time, the toilet is dirty and smells bad, printing applications often have

problems, service procedures are not clear, and sometimes they are transferred to other officers, complicated procedure, there is no notification of any changes to procedures/flows/services/new system, there is no notification when there is a schedule change, nurses are not friendly, officers lack detail in explaining service procedures, and Doctor's service time is limited

IV. Conclusion

Handling complaints in modern hospitals already needs to be considered in improving services. NVivo was very helpful in this research, especially in processing data and analyzing various information from debriefing with all informants. Most of the patient complaints are not about medical services but administrative services and support services such as registration, parking queues, and others. Dharmais Cancer Hospital customers expect competence and professionalism from human resources through friendly service, speed, and accuracy. Another issue that has surfaced is service integration, both manual and technology-based. There is a need to reduce various complaints for additional skilled and trained human resources, especially for support sections. Apart from that, the available medical staff also stated that adding and rejuvenating medical and non-medical equipment was necessary. The customer's expectation is an integrated service starting from the time of diagnosis to planning and preparing for ongoing effective and efficient treatment to save on health expenses. In essence, all products/services must aim to improve the quality of life of cancer patients, which is the main indicator of service success. What needs attention and is common in hospitals in Indonesia is complaints about doctors not arriving on time, so patients wait too long. The Doctor's arrival on schedule is the patient's hope, especially for today's modern hospital services.

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