

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

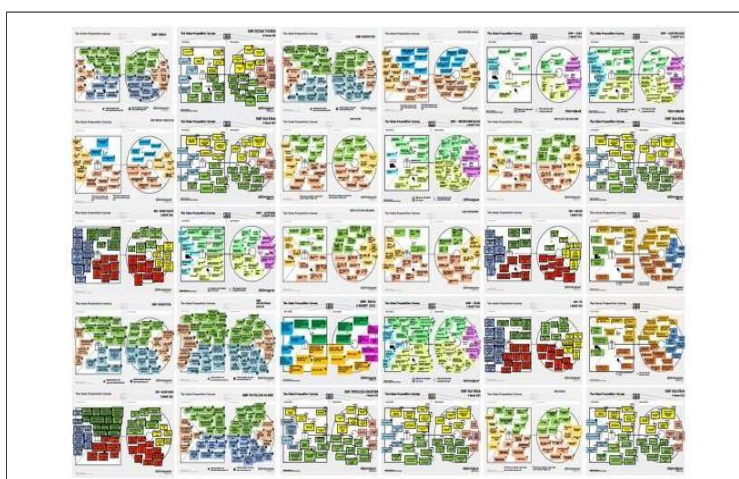
1) Customer Characteristics



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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