DECIPHERING THE *TOPOGRAFISCHE DIENST*'S MAPS: INVESTIGATING THE ARRANGEMENT AND DESCRIPTION OF THE *TOPOGRAFISCHE DIENST*'S MAPS IN THE NAN, UBL, AND ANRI

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INTRODUCTION

1.1 Background

"One might fight but cannot win a war without maps."[1] This statement by Jürgen Espenhorst indicates the importance of maps. They are a tool that visually depicts the physical and social characteristics of the earth. There are various purposes of maps, such as, research, military, tourism, politics, economics, and governmental purposes. There are also varied users of maps, including geographers, cartographers, geologists, and urban planner. Maps provide geographical information for users. They also have their own stories that encompass their processes, including, creating, transferring, and managing. These processes represent the context of maps of the *topografische dienst*. This context plays important roles in providing access of the *topografische dienst*'s maps. This thesis scrutinizes the history of the *topografische dienst*'s maps in the three institutions, the Leiden University library (UBL), National Archives of the Netherlands (NAN) and National Archives of the Republic of Indonesia (ANRI), and how it affects retrieval aids for users. It is important because it looks at the maps of the *topografische dienst* from both Dutch and Indonesian institutional perspectives and uses this unique cross-cultural and historical lens to provide new insights into the difference between archival and library science. It also gives a contribution for the archival science, map arrangement and description in particular.

Maps are a distinct medium. As such they pose special challenges to librarians and archivists to curate, arrange and describe maps and provide access for users. There are numerous challenges that reflect distinctive characteristics of maps which both professions should consider. Maps, first, are built upon symbols. These symbols reflect a representation of physical and social features of certain areas, thus archivists and librarians should have knowledge about cartography in order to create user-friendly descriptions. A second challenge is the spatial information contained in maps. Geographical references are a distinctive characteristic of maps that differentiate them from other types of sources. Thirdly, the variety among maps poses a challenge to archivists and librarians. There are numerous types of maps, such as general

[1] Jürgen Espenhorst, "A Good Map Is Half the Battle! The Military Cartography of the Central Powers in World War I." In *History of Military Cartography*, eds Elri Liebenberg, et al, (Germany: Springer, 2014): 83.

reference, thematic, and topographic maps. Librarians and archivists should be able to distinguish these differences and accommodate them in organizing and describing maps.

The maps of the *topografische dienst* (the topographic service) consist primarily of topographic maps. Topographic maps are maps that show the natural and/ or physical landscape, often using contour lines.[2] The *topografische dienst* was a mapping agency in the Netherlands and their colonial states. First established in 1814,[3] it had numerous functions and activities. These functions and activities are reflected in the context of the maps originating from the *topografische dienst*. The term of the *topografische dienst* in this thesis is used for the topographic service in the Netherlands and the Dutch East Indies. Both mapping agencies were reorganized due to their functions and activities. The maps of the *topografische dienst* are currently held and managed by various archival institutions and libraries.

Archives and libraries are the institutions that are the most commonly assigned to curate maps and provide access to users. However, both institutions have different role/ purposes. Terry Cooks contends that archival institutions represent a house of memory.[4] On the other hand, Shiyali Ramamrita Ranganathan, as cited by Wallace Koehler (1963, 354) defines a library as a tool of universal education.[5] It also reflects a symbol of cultural imagery that transforms through time.[6] Archivists and librarians have dealt with the aforementioned challenges in different ways to produce user-friendly retrieval aids. This thesis aims at analyzing and comparing the arrangement and description of the *topografische dienst*'s maps in the National Archives of the Netherlands (NAN), the Library of Leiden University (UBL) and the National Archives of the Republic of Indonesia (ANRI) according to the perspectives of archivists and librarians. It describes the different methods and practices of the two fields in organizing and describing maps originating from the *topografische dienst* in the aforementioned institutions.

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[2] A contour line is an imaginary line that connects dot with the the same elevation.
[3] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst en Rechtvoorgangers, (18e eeuw) 1814-1932 (1958)*, (Den Haag: Nationaal Archief, 1992): 7, accessed February 1, 2017, http://www.gahetna.nl/collectie/archief/pdf/NL-HaNA_4.TOPO.ead.pdf.
[4] Terry Cook, "What Is Past Is Prologue: a History of Archival Ideas since 1898 and the Future Paradigm Shift." *Archivaria* 43 (1997): 18, accessed March 1, 2017, http://archivaria.ca/index.php/archivaria/article/viewFile/12175/13184.
[5] Wallace Koehler, *Ethics and Values in Librarianship: a History*, (London: Rowman & Littlefield, 2015): 12. Shiyali Ramamrita Ranganathan, *The Five Laws of Library Science*, (Bombay: Asia Publishing House, 1963): 354.
[6] Wallace Koehler, *Ethics and Values in Librarianship*: 5.

Three institutions will be investigated in this thesis: the NAN, UBL, and ANRI. The NAN is the national archival institution of the Netherlands. It was established in 1802.[7] It provides information about the past events of the Netherlands.[8] As the state archives, the NAN is obliged to collect and manage documents that contain the collective memories of the Netherlands, for instance, Dutch political and social history, and colonization. Indonesia, the successor of the Dutch East Indies, also has a national archival institution, namely the ANRI, the successor of the *landsarchief*. The government of the Dutch East Indies established the *landsarchief* on January 28, 1892.[9] The ANRI holds and manages colonial and Indonesian governmental archives. The two archival institutions utilize different tools or standards to create finding aids according to their differing archival national policies. The UBL was founded in 1575. It aims to provide information from their collections, including books, journals, maps, photographs, and manuscripts to university community as well as the interested public. This information includes both historical and non-historical subjects. Thus, the Library of Leiden University has broader information than the aforementioned archival institutions.

Archivists and librarians have different perspectives about the arrangement and descriptions of maps. Archivists consider a map as an archive that has structure, content, and context. Furthermore, they perceive it as the result of activities and functions of its creator agency, in this case the *topografische dienst*. Archivists have to arrange these maps according to the archival principles: provenance and original order. The principle of provenance or the *respect des fonds* aims at ensuring that there are no documents included without the context of its creator agency in order to preserve the context of archives.[10] The principle of original order reflects how archives were arranged by the creator agency before transferring to the archival institution. Furthermore, in organizing maps, archivists must have knowledge about the history of the *topografische dienst*. In addition, they consider maps as well-structured and organized

[7] TANAP, "Nationaal Archief," accessed March 2, 2017, http://www.tanap.net/content/archives/archives.cfm?ArticleID=209#top.
[8] Nationaal Archief, "Missie van het Nationaal Archief," accessed March 2, 2017, http://www.nationaalarchief.nl/organisatie/missie.
[9] Arsip Nasional Republik Indonesia, "Sejarah Lembaga," accessed March, 20, 2017, http://www.anri.go.id/detail/65-129-Sejarah-Lembaga.
[10] Society of American Archivists, "Provenance," accessed March 20, 2017, http://www2.archivists.org/glossary/terms/p/provenance.

documents not only from the result of creating, but also receiving maps from other institutions.[11] The map archivists of NAN consider the functions of the *topografische dienst* to arrange its maps. The extent of the collection of maps of the *topografische dienst* is the result of archival processes of which appraisal and selection of materials are the most important stages.

Librarians, on the other hand, consider the *topografische dienst*'s maps as published bibliographic materials. The librarian principles of practice and ethics encompass access, classification, democracy, literacy, intellectual property and freedom, professionalism and training, social obligations, stewardship, and preservation of historical record. According to the fourth of Ranganathan's Laws, "save the time of the reader", thus librarians have to provide a user-friendly retrieval aid to the materials, including the *topografische dienst*'s maps. Furthermore, according to Wallace Koehler, they have to arrange their collections according to logic.[12] Librarians have two processes in arranging maps: cataloging and classification. The Royal Geographical Society argues that cataloging and handling maps differs from books.[13] In general, librarians have the Dewey classification system and Library of Congress subject headings to classify their bibliographic materials. However, Christopher Edmond Merret contends that these classification systems are not appropriate for maps.[14] Librarians might describe topographic maps per item to help users to find their maps. Hence, it might not be mandatory for the librarians to follow the original arrangement of maps. Nevertheless, they have a bibliographic standard for cartographic materials to describe maps, namely the International Standard Bibliographic Description for Cartographic Materials (ISBD-CM).

Description is another process of making retrieval aids. Both librarians and archivists have their own standards in describing their collections, maps in particular. How can librarians and archivists deliver a depiction of maps to non-professional map readers or users? Thomas Barkowsky and Christian Freska contend that the limitations in portraying maps result from limited knowledge about cartography[15] because describing maps requires cartographic

[11] Paul Brunton and Tim Robinson, "Arrangement and Description." In *Keeping Archives*, eds. Judith Ellis (Australia: The Australian Society of Archivists Inc, 1993): 228-235.
[12] Wallace Koehler, *Ethics and Values in Librarianship*: 18-19.
[13] Christopher Edmond Merret, *Cataloguing and Classification: a Comparison of Approaches*, (United Kingdom: University of Sheffield, 1976): 4.
[14] Christopher Edmond Merret, *Cataloguing and Classification*: 22.
[15] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps." *Spatial information theory: A theoretical basis for GIS*, eds S. Hirtle & A. Frank, (Berlin: Springer, 1997): 347.

knowledge to interpret the symbols on them. Furthermore, they argue that the legend might not be able to render full information about maps.[16] Cartographers and geographers are generally not concerned with the archival principles of provenance and original order. Thus, they lose the context of maps.

Archivists consider description as an intellectual process for describing the context, structure, and content of archives.[17] The General-International Standard Archival Description, henceforth ISAD-G, is a standard for describing archives. An archival description has various layers of archival descriptions: *fonds,* series*,* files and items.[18] This archival standard is better suited for textual archives maps and might not provide adequate information about cartographic materials. The Indonesian state archives, for example has a regulation on archival management of cartographic and architectural materials.[19] This regulation includes the elements of map description on the item level. Librarians, on the other hand, have an international bibliographic standard to describe cartographic materials, known as the ISBD-CM including all types of maps. This thesis will explore this type of differences between the descriptions of archivists and librarians in detail.

1.2 Research Questions

The goal of this research is to scrutinize the arrangement and description of the *topografische dienst*'s maps produced during the nineteenth and twentieth centuries which are kept in the National Archives of the Netherlands (NAN), National Archives of the Republic of Indonesia (ANRI) and the Library of the Leiden University (UBL) from the perspectives of archivists, geographers/ cartographers, and librarians. Moreover, this thesis will explore the similarities and differences between library and archival science, as well as geography, in providing access to spatial information without neglecting the context and functions of the mapping agency.

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[16] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps": 350.
[17] Randall C. Jimerson, "Archival Descriptions and Finding Aids."*Archives and Manuscripts* 18 (2002): 125, accessed February 1, 2017, http://dx.doi.org/10.1108/10650750210439331.
[18] International Council of Archives, *General-International Standard Archival Description*, (Ottawa: ICA, 2002): 16-17.
[19] Arsip Nasional Republik Indonesia, *Peraturan Kepala Arsip Nasional Republik Indonesia Nomor 16 Tahun 2012 tentang Pedoman Pengelolaan Arsip Kartografi dan Kearsitekturan*, (Jakarta: Arsip Nasional Republik Indonesia, 2012), accessed February 24, 2017, https://jdih.anri.go.id/peraturan/Perka_16_2012_Ped.%20Pengelolaan%20Arsip%20Kartografi&Kearsitekturan.pdf.

The main research question of this thesis is how are the maps of the *topografische dienst* arranged and described in the NAN, UBL, and ANRI? This research question consists of five sub-questions. The first sub-question is, what were the shifting functions and activities of the *topografische dienst* and how did the activities of its cartographers and geographers influence the map organization and description? The second sub-question is, how is the arrangement and description of the collection of the topographic maps in the NAN? The third sub-question is, how is the arrangement and description of the topographic maps of the *topografische dienst* in the library of Leiden University? The fourth sub-question is, how is the arrangement and description of the *topografische dienst*'s maps in the ANRI? Fifth and finally, how do the comparisons of the practices of these three aforementioned institutions compare?

1.3 Previous Related Studies

Numerous scholars have thought and written about the arrangement and description of maps and related topics. Scholars such as Marijke Kok and Mary Lynette Larsgaard have analyzed systems for arranging and describing maps not only from the perspectives of librarians and archivists as information providers, but also from the point of views of cartographers and geographers as users and map makers. To the best of my knowledge, there have been no studies addressing the similarities and differences between cartography/ geography and archival science in providing access to spatial information. There are, however, numerous academic studies concern on the relationship between cartography/ geography and librarian science in organizing and describing maps. One such study is that of Lisa R. Johnston, a co-director of the University Digital Conservancy of University of Minnesota. She contends that rendering access for maps is a duty of librarians.[20] However, archivists should be involved in delivering access for maps to users in order to preserve the context of maps. This argument is analogous with study of Wallace Koehler.[21]

[20] Lisa R. Johnston and Kristi L. Jensen, "Map Happy: A User-Centered Interface to Library Map Collections Via a Google Maps (Mashup)." *Journal of Map & Geography Libraries* 5 (2009): 114, accessed February 1, 2017, DOI: 10.1080/15420350903001138.
[21] Wallace Koehler, *Ethics and Values in Librarianship*: 238-240.

From the perspective of archival science, arrangement is a process in organizing archives physically according to the principles of provenance and original order.[22] It aims at detecting the numerous relationships evident in a body of archives.[23] There are a few archival scholars who explore the arrangement and description of maps in particular from the perspectives of archival science. Paul Brunton and Tom Robinson (1993), Australian archivists, first, investigate the arrangement and description in general.[24] Secondly, Marijke Kok (1984), a Dutch archivist, explores the description and arrangement of maps.[25] She explains how the original order depicts evidence of the particular activities performed by creating agencies. She also contends that the activities of the mapping agency can be utilized as a parameter to arrange maps.[26]

There are also numerous studies about the map arrangement and description from the perspectives of library science and geography. In the first place, Samuel Whittemore Boggs and Dorothy Cornwell Lewis, a geographer and librarian, investigated the cataloging and classification system of maps in 1932.[27] Their study revealed a new method to catalog maps which was totally different with cataloging books. Secondly, Roman Drazniowsky (1964), a former curator of American Geographical Society Collection, investigated further research about map cataloging systems based on the geographical perspectives.[28] Afterward, Christopher Edmond Merret (1976), a librarian of University of Sheffield, studied the varied approaches of map cataloging and classification. Fourth, in 1998 Mary Lynette Larsgaard, an American librarian, studied the cataloging management of maps.[29] She was also concerned with the digital maps and cataloging. Fifth and finally, Wallace Koehler (2015), an American librarian and information scientist, explored the development and the future of librarianship.[30]

[22] Paul Brunton and Tim Robinson, "Arrangement and Description": 222.
[23] Terry Eastwood, "A Contested Realm: The Nature of Archives and the Orientation of Archival Science." In *Currents of Archival Thinking*, eds. Terry Eastwood and Heather MacNeil, (California: ABC-CLIO, 2010): 8.
[24] Paul Brunton and Tim Robinson, "Arrangement and Description": 222-247.
[25] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief." In *Titelbeschrijven voor Kartografische Documenten Verslag Zomercursus NVK 1982*, eds. J. Smits en G. Staal, (The Netherlands: Nederlandse Vereniging voor Kartografie, 1983: 31-37.
[26] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 33.
[27] Samuel Whittemore Boggs and Dorothy Cornwell Lewis, *Classifications and Cataloging of Maps and Atlases,* (Washington D.C.: Unknown, 1932).
[28] Roman Drazniowsky, *Cataloguing and Filing Rules for Maps and Atlases in the Society's Collection*, (New York: American Geographical Society, 1964).
[29] Mary Lynette Larsgaard, *Map Librarianship: an Introduction,* (Colorado: Libraries Unlimited, Inc., 1998).
[30] Wallace Koehler, *Ethics and Values in Librarianship: a History*, (London: Rowman & Littlefield, 2015).

From this literature review, it appears that the archival arrangement and description of maps is an understudied subject for archival science. Ralph E. Ehrenberg (1982), first, studies the archival management of maps and architectural drawings that encompasses acquisition, arrangement and description, and preservation.[31] Afterward, Marijke Kok is a scholar who studies the archival description and arrangement in general. However, she does not focus on the maps of the *topografische dienst*. In order to fill this gap, I am going to utilize the previously mentioned studies and conduct original research. With reference to the shifting functions of the *topografische dienst* in the East Indies, I will also use my previous research.[32]

1.4 Sources and Methodology

Both primary and secondary sources will be used to answer the research questions. Original research will be conducted on the textual archives of the *topografische dienst* and the Dutch ministry of colonies that are available in the National Archives of the Netherlands (NAN) to get a picture of the historiography, functions, and activities of the *topografische dienst* in the Netherlands as a creator agency of topographic maps. This information will then be used to scrutinize the original arrangement of maps. Additional information about the *topografische dienst* in the East Indies will be obtained from the publications of the Indies topographic service that are available in the UBL. Retrieval aids of topographic maps in the NAN, UBL, and ANRI will also be employed to analyze the arrangement and description of maps. In order to analyze the elements of map descriptions, numerous librarian and archival standards will be employed in this thesis. Interviews constitute another primary source. The interviewees are representatives of the NAN and UBL, including Ron Guleij and Gijs Boink as map archivists of the NAN and Lam Ngo and Martijn Storms from the UBL. An archivist of the ANRI, Bakat Untoro, is also interviewed in April 2017. These experts represent the perspectives of archivists and librarians in arranging and describing maps. The information about the NAN and archival practices in the NAN are derived from various interviews during the internship in the NAN during November

[31] Ralph E. Ehrenberg, *Archives and Manuscripts: Maps and Architectural Drawings*, (Chicago: The Society of American Archivists, 1982).
[32] Octavia Syafarwati, "The Shifting Functions of the *Topografische Dienst* in the Dutch East Indies (1864-1907)," (BA Thesis, Leiden University, 2016).

2016 – February 2017, including Frans Van Dijk[33], and Benhard Mantel[34]. The interviewees of the UBL are interviewed in March and April 2017. The works of cartographers and geographers in interpreting maps will be used to analyze description elements of maps. Afterwards, both standards and various literatures will be analyzed to inquire the map descriptions to be informative for users.

In addition to the primary sources, this thesis also considers the works of previous scholars on this topic. There are numerous previous studies that will be consulted for this thesis. They are Marijke Kok, Roman Draznioswky, and M.H.G. Clement-van Alkemade. The work of Kok will be used to analyze the arrangement and description of the *topografische dienst*'s maps from the perspective of archival science. Afterward, the studies of Drazniowsky and Clement-van Alkede will be utilized to analyze the maps of the *topografische dienst* from the perspectives of librarians.

This thesis will consist of five chapters. The first chapter will focus on the *topografische dienst* in the Netherlands during the nineteenth until the twentieth century and the characteristics of maps. The second chapter mainly discusses the arrangement and description of the maps of the *topografische dienst* that are kept and managed by the National Archives of the Netherlands, The Hague. Towards its end, chapter two will compare this information with that of chapter one. The third chapter will study the arrangement and description of the *topografische dienst*'s maps in the special collections of Leiden University's library. The fourth chapter will study the arrangement of the maps *topografische dienst* in the Dutch East Indies that are managed by the Indonesia state archives. Finally, the fifth chapter will be a conclusion of this thesis. It will discuss and analyze the comparisons of the arrangement and description of the *topografische dienst* in the NAN, UBL, and ANRI and offer recommendations for practitioners.

[33] Frans Van Dijk is a project leader of Shared Cultural Heritage of the National Archives of the Netherlands (NAN).
[34] Benhard Mantel is a senior acquisition at the NAN.

CHAPTER I

THE *TOPOGRAFISCHE DIENST* AND ELEMENTS OF MAPS

The *topografische dienst* was an important mapping agency to map the geographical conditions in the Netherlands and their colonial states. As a government institution, it had organizational structures that changed over time due to their expanded functions. Consequently, it created varied archives: written-archives and maps. This history is important to arranging and describing their archives without losing their context. The context is one of the most fundamental elements of maps besides structure and content.[35] It also helps users to analyze the *topografische dienst*'s maps. These maps were considered as the main product of the *topografische dienst*. These maps were primarily distributed not only to the army but also to civilian institutions; hence they can be found in numerous institutions, for instance, archival institutions, and university libraries. The maps of the *topografische dienst* are currently used for research purposes. The understanding of map elements is needed to provide access for users. This chapter aims at investigating the administrative history of the *topografische dienst* in the Netherlands during the nineteenth until the twentieth centuries. It provides the context of the *topografische dienst's* archives, maps in particular. Consequently, I will scrutinize the archival management and distribution of the *topografische dienst*'s maps. Thereafter, it investigates the elements of map and analyzes them in order to analyze the elements of map descriptions. This chapter will consist of three sub chapters dealing with the administrative history, archives, and map elements respectively.

1.1 The Administrative History of the *Topografische Dienst*

The administrative history of the *topografische dienst* is important to delineate the context of their maps by analyzing their functions. The *topografische dienst* was a military mapping institution under the *Ministerie van Oorlog* (MVO), meaning the Dutch Ministry of War.[36] Most of the time, the topographic mapping was initiated by army topographers.[37] This was a trend of

[35] "Context", Society of American Archivists, accessed May 17, 2017, http://www2.archivists.org/glossary/terms/c/context.
[36] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst*: 7.
[37] Norman Joseph William Thrower, *Maps & Civilization: Cartography in Culture and Society*, (Chicago: University of Chicago, 2008): 125-126, accessed February 25, 2017,

mapping in most European countries during the first half of nineteenth century.[38] There were three reorganizations of the *topografische dienst* dating from the nineteenth until the twentieth century which resulted in name changes: the *topographische bureau* (topographic office), the *topografische inrichting* (topographic institute), and the *topografische dienst* (topographic service).[39] These reorganizations are indicative of the shifting functions and increasing activities of the *topografische dienst* during this period. This sub-chapter aims at investigating the administration history of the *topografische dienst* in the Netherlands.

The *topographische bureau* was first established on March 12, 1814.[40] It was intended to map the topographic conditions for the military purposes in the Netherlands. The maps that they had produced contained information about accessibility, water bodies, geomorphology, geology, and administrative lines. Consequently, these maps were also used by various Dutch institutions. Thus, it was transformed from the *topographische bureau* into the *topografische inrichting*.

The *topografische inrichting* was established in 1846.[41] It was under the *Directeur der Militair Verkenningen*, meaning Division of Military Reconnaissance of the MVO. It consisted of cartographic bureau and staff.[42] Leonard S. Wilson, a geographer from Carleton College, contends that charting and reconnaissance are generally refined by political borders.[43] As a colonizer and a state, the Dutch mapped their border and their colonies in order legitimate their power against other countries. The functions of the *topografische inrichting* were expanded to other sectors. It was appointed to provide maps for the Dutch army, department of water management, geological service, het *staatsboschbeheer* (Dutch Forestry Commission), *het mijnwezen* (Dutch mining institution), *den dienst der rivieren* (Dutch service for rivers), *den dienst der spoorwegen*, and other private and public institutions. The work of the *topografische inrichting* in South Africa was used by the British Military Mapping Agency as their based maps

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http://web.b.ebscohost.com.ezproxy.leidenuniv.nl:2048/ehost/ebookviewer/ebook/bmxlYmtfXzI2NjAxNl9fQU41?sid=bc0134be-9090-4f94-9529-63429d6a7ce8@sessionmgr106&vid=0&format=EB&rid=1.

[38] Imre Josef Demhardt, "Military Mapping against All Odds: Topographical Reconnaissance in the United States from the Revolutionary War to the Civil War." In *History of Military Cartography*, eds Elri Liebenberg, et al, (Germany: Springer, 2014): 253.

[39] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst*: 5.

[40] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst*: 7.

[41] Nationaal Archief, Den Haag, Topografische Dienst, nummer toegang 2.13.46, inventarisnummer 57.

[42] NL-HaNA, Topografische Dienst, 2.13.46, inv.nr. 57.

[43] Leonard S. Wilson, "Library Filing, Classification, and Cataloging of Maps, with Special Reference to Wartime Experience." *Annals of the Association of American Geographers 38* (1948): 9, accessed February 23, 2017, http://www.jstor.org/stable/2560923.

to chart South Africa in the nineteenth century.[44] This phenomenon indicates that the *topografische inrichting* was aimed also in supervising the topographic mapping in their colonial states so they could produce accurate maps. The *topografische inrichting* was also deployed to chart border lines of the Netherlands as stated in the letter of Dutch Minister of Defense on July 21st, 1930 because the Dutch government had to ensure their defense and sovereignty. The *topografische dienst* was also deployed for education in topographic charting.[45] In a nutshell, the *topografische inrichting* provided their services not only for the military but also for civilian institutions, including educational, colonial and political organizations. Nevertheless, these aforementioned documents did not concern topographic mapping as a Dutch colonizer's tool to conquer their colonial states as suggested by Vivian Louis Forbes and Marion Hercock.[46]

The *topografische dienst* was established in 1931 based on the approval letter of the Dutch Minister of Defense, L.N. Deckers dated December 28th, 1931. This mapping agency was charged with aerial photography in the Netherlands. They also had a new function to print and published their works for various institutions.[47] In the long run, the activities and functions of the *topografische dienst* as a mapping agency during the nineteenth and the twentieth centuries increased. It had various reasons for mapping: military services, economics, politics, education, and colonization. Their functions and activities are used to arrange their maps in order to deliver the context of their charts to users. The *topografische dienst* was merged with the Dutch Cadaster in 2004, known as "*topografische dienst kadaster*.[48] Gijs Boink, an archivist of the National Archives of the Netherlands states that this merger is triggered by the bureaucratic efficiency of mapping between military and civilian and information changing of spatial information across Europe.[49]

[44] Elri Liebenberg, "Mapping for Empire: British Military Mapping in South Africa, 1806-1914." In *History of Military Cartography*, eds Elri Liebenberg, et al, (Germany: Springer, 2014): 301.
[45] NL-HaNA, Topografische Dienst, 2.13.46, inv.nr. 192.
[46] Vivian Louis Forbes and Marion Hercock, "Charting the Way to Empire: The Hydrographic Office." In *Mapping Colonial Conquest: Australia and Southern Africa,* eds Norman Etherington, (Australia: University of Western Australia Press, 2007): 36-37.
[47] NL-HaNA, Topografische Dienst, 2.13.46, inv.nr. 57.
[48] Martijn Storms, "Kaartcollecties in Nederland: de Collecties van de Voormalige Topografische Dienst Nederland." *Caert-Thresoor* 34, (Den Haag: Barent Langenes Stichting, 2015): 214.
[49] Gijs Boink, "Topografische Dienst," interviewed by Octavia, March 22, 2017.

1.2 Archives as Products of the *Topografische Dienst*'s Activities

There are various definitions of archives. Richard Pearce-Moses, the 61st President of the Society of American Archivists during 2005-2006, first, defines archives as materials created or received by a person, family, or organization, public or private that correspond to their activities and functions, and preserved because of their evidential and informational values.[50] Sue McKemmish, a laureate of the Australian Society of Archivists, further contends that an archive is a result of the social and organizational activities of the creator agencies, and archival processes of which appraisal and selection play an important role.[51] She also argues that archives are characterized by their context and transactions in any media, such as paper, microfilm, maps, plans, etc. Therefore, they are considered unique due to their characteristics: context, structure, and content. These characteristics are derived from their processes: creating, using-maintaining, and disposing. As previously mentioned, the *topografische dienst* also received archives from their colonial states. Therefore, these archives are classified as colonial archives. This sub-chapter aims at investigating the maps of the *topografische dienst* and its distribution in the Netherlands.

The *topografische dienst* has two different media of archives as the results of their functions and activities of mapping: written-archives and maps (see figure 1). Gijs Boink, the archivist of the NAN informed that the written archives and maps were first transferred to the NAN in 1980 when the *topografische dienst* was moved from Delft to Emmen.[52] The written archives are mainly about concerning decisions, reports, and letters. The NAN holds 11,70 meter linear of textual-archives and 5.693 maps of which were transferred in sequences that become the map arrangement in the NAN.[53]

Maps were the main products of the *topografische dienst*. Before these maps were transferred to the NAN, they had been kept in the map storage of the *topografische dienst* in Delft and the rest were moved to their map storage in Emmen. Boink informs that the

[50] Richard Pearce-Moses, *A Glossary of Archival and Records Terminology*, (Chicago: the Society of American Archivists, 2005): 30, accessed January 4, 2017, http://files.archivists.org/pubs/free/SAA-Glossary-2005.pdf.
[51] Sue McKemmish, "Introducing Archives and Archival Programs," In *Keeping Archives*, eds. Judith Ellis, (Australia: Thorpe, 1993): 1-4.
[52] Gijs Boink, "Topografische Dienst."
[53] H. den Hertog, *Inventaris van de Archieven van de Topografische Dienst en Rechtsvoorgangers, (1789) 1814-1932 (1943); Collectie Krayenhoff, 1798-1811; Commissie De Man, 1822-1827*, (Den Haag: Nationaal Archief, 1982): 5, accessed on February 22, 2017, http://www.gahetna.nl/collectie/archief/pdf/NL-HaNA_2.13.46.ead.pdf.

topografische dienst not only produced maps but also collected maps from the previous period for the historical purposes.[54] This story of the archives transference represents the archival context that must be delivered to users. The maps of the *topografische dienst* are also distributed to other institutions. Thus, the unique value of the *topografische dienst*'s maps are questionable because they can be found in various institutions, for instance the NAN, Amsterdam University, the *Konninklijke Instituut voor de Tropen*, meaning the Royal Tropical Institute (KIT), the *Koninklijk Instituut voor Taal-Land- en Volkenkunde,* meaning the Royal Netherlands Institute of Southeast Asian and Caribbean Studies (KITLV), and the Johannes Tiberius Bodel Nijenhuis' collection at the UBL as shown by figure 1.

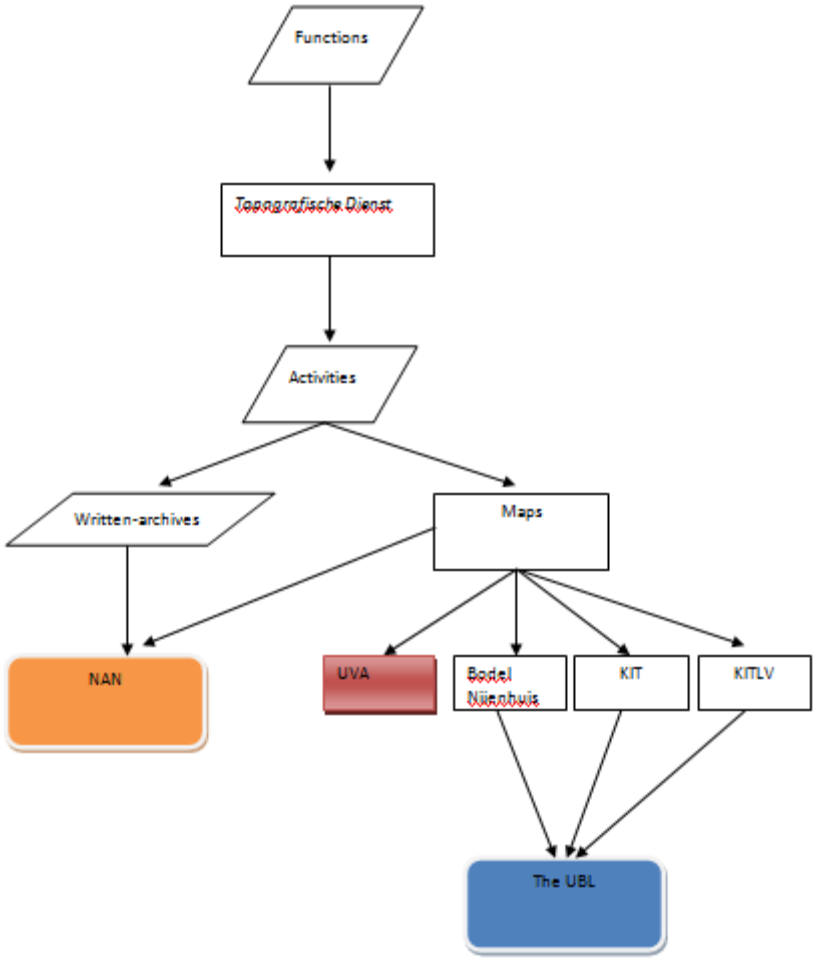


Figure 1. The flowchart of the *topografische dienst*'s maps in the Netherlands

[54] Gijs Boink, "Topografische Dienst."

Figure 1 indicates that there are nowadays three institutions that hold and manage the maps of the *topografische dienst* in the Netherlands: the NAN, University of Amsterdam, and the Library of Leiden University (UBL). Thus, there are similar maps can be found in the aforementioned institutions. The NAN has the most complete collection of the *topografische dienst*'s maps because this mapping agency was obliged to transfer their archives by the Dutch record act.[55] The special collection of the Leiden University's Library (UBL) holds and manages the maps of the *topografische dienst* from different collections: the Johannes Tiberius Bodel Nijenhuis (known as Bodel Nijenhuis collection), the KIT, and KITLV. The collection of the Bodel Nijenhuis is a private/ personal collector of 72.000 maps of which consisted of the maps originating from the *topografische dienst*.[56] His map collections were donated to the Leiden University for research purposes according to his will in 1872.[57] His map collections were from purchases and donations from other institutions. The collection of the KIT held and managed the ca. 1.000 maps of the *topografische dienst* of which concern on colonial maps, the Dutch East Indies in particular.[58] In 2013, the KIT was closed down by the Dutch government and their maps were donated to the UBL.[59] The KITLV held and managed ca. 15.000 maps of mainly the Netherlands East Indies and other Dutch colonial states. In 2014, their map collections were transferred to the UBL. The three collections reflect different methods in arranging and describing the maps originating from the *topografische dienst* that will be investigated in chapter 3.

By and large, archives result from the activities of creating agencies. They also reflect functions of their creator agencies. The varied and numerous archives of the *topografische dienst* reflect the various functions and activities of this mapping agency during the nineteenth and twentieth centuries. It produced written-archives and maps as by-products of its activities. From the perspectives of the archival science, the written archives are considered as the main documents of the *topografische dienst* because they contain evidential and informational values. The textual archives and maps of the *topografische dienst* were transferred to the NAN in 1980's

[55] Gijs Boink, "Topografische Dienst."
[56] Leiden University, *Collectieplan UBL*, (Leiden: Universiteit Leiden, 2012): 236-237.
[57] Martijn Storms, "Topografische Dienst," Interviewed by Octavia, April 14, 2017.
[58] Martijn Storms, "Kaartcollecties in Nederland": 215.
[59] Martijn Storms, "Topografische Dienst," Interviewed by Octavia, March 24, 2017.

as obliged by the Dutch Records Act.[60] Even though maps were the main output from their business activities, the archival science might consider them as a supplement of the main documents (written-archives). The uniqueness of map archives, as suggested by Terry Eastwood, is their interrelatedness.[61] This interrelatedness encompasses not only among maps but also between its functions and its arrangement in order to preserve the context of the maps which is considered important for users to make critical use of these maps. Therefore, their administrative history is important to arranging and describing their archives so as to preserve their context. The uniqueness of the *topografische dienst*'s maps are likely questionable because these topographic maps can be found in many institutions, for instance the NAN, UBL, and University of Amsterdam. There are two professions in managing and providing access of the *topografische dienst*'s maps: archivists and librarians. Nevertheless, both professions have different perspectives, methods, and standards in arranging and describing maps of the *topografische dienst*. On one hand, archivists consider the administrative history of the *topografische dienst* important to arrange these maps. On the other hand, librarians emphasize the findability of these maps without paying attention to its context. These differences of arranging and describing archives of the Dutch topographic service from the perspectives of librarians and archivists will be discussed in the next chapters.

1.3 Map Elements

There are numerous studies about the topographic maps and their interpretation. One such study is that Samuel Whittemore Boggs and Dorothy Cornwell Lewis who contend that topographic maps are intermediate maps between cadastral[62] and general maps.[63] Both archivists and librarians have to determine elements to describe maps in order to provide information about the contents of maps. United States Geological Surveys (USGS) further argues that interpreting maps requires an understanding of map's symbols.[64] Understanding the legend of maps might help user to read the symbols. However, maps symbols vary from one mapping agency to

[60] Gijs Boink, "Topografische Dienst."
[61] Terry Eastwood, "A Contested Realm": 8.
[62] The Cadastral Map is a map with a big scale, usually it employs 1: 10.000 or bigger. Most of the time, this type of maps is used for the land property.
[63] Samuel Whittemore Boggs and Dorothy Cornwell Lewis, *Classifications and Cataloging of Maps and Atlases*: 14.
[64] United States Geological Surveys, "Topographic Map Symbols": 1, accessed February 5, 2017, https://pubs.usgs.gov/gip/TopographicMapSymbols/topomapsymbols.pdf.

another. In this sub-chapter, I am going to discuss the elements of maps, in order to determine the elements of map descriptions from the perspectives of cartographers and geographers as the creator or the author of maps. Afterward, I am going to analyze these elements to establish the suggested elements to describe maps. A good description of map will help users to obtain the exact maps from the collection of the *topografische dienst*.

There are various studies about elements of spatial information. Geoffrey Edwards, first, uses the term *geocognostics* as a framework that combines cognitive and geometric approaches in providing spatial information.[65] The *geocognostics* have two basic representational structures: *view* and *trajectory*. The term "view" refers to the perceptual experiences recorded by an agent. He also contends that "view" are sequences of perceptual experiences that are persistent.[66] This term view reflects the ability of the archivists and librarians in describing maps, whereas the term "trajectories" indicates standards of description as a tool to describe maps. Markus Knauff, et al., further argues that topological features relate to the human spatial knowledge.[67] Thus, the title appears to represent the most important element of map descriptions because users might use the title as a keyword to find maps for which they are looking.

Peuquet and Qian, afterwards, suggest that there are three data components of maps: space, time, and attributes.[68] Therefore, these components can be used in organizing topographic maps. Lisa R. Johnston and Kristi L. Jensen, on the other hand, propose elements to describe maps. They are primary and alternative title(s), geographic and astronomical positions, topics of the maps, scale, author, date and name of publication, map depiction, and call number.[69] Afterwards, Thomas Barkowsky and Christian Freska suggest a schema of precedence hierarchy of map interpretation as shown by figure 2.[70] It indicates that understanding the context of *topographische dienst*'s maps is the most important thing in arranging and portraying them individually instead of understanding them as a single entity. Hence, the librarians and archivists are expected to understand the context of the creation of the *topografische dienst*'s maps in order

[65] Geoffrey Edwards, "Geocognostics – A New Framework for Spatial Information Theory." *Springer* 1329 (2005): 455, accessed February 3, 2017, DOI 10.1007/3-540-63623-4_67.
[66] Geoffrey Edwards, "Geocognostics": 455.
[67] Markus Kanuff, "A Cognitive Assessment of Topological Spatial Relations: Results from an Empirical Investigation." *Spatial Information Theory A Theoretical Basis for GIS* (1997): 193, accessed on February 14, 2016, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.55.5000&rep=rep1&type=pdf.
[68] Geoffrey Edwards, "Geocognostics": 458.
[69] Lisa R. Johnston and Kristi L. Jensen, "Map Happy": 119-121.
[70] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps": 358.

to provide users with the most important information about the maps production as indicated in figure 2. Figure 2 also indicates that context of maps is important not only from the perspective of archivists but also geographers/ cartographers.

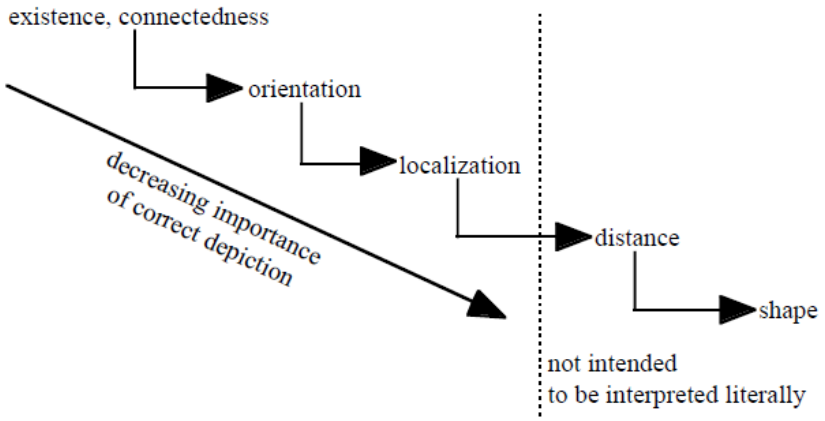


Figure 2. Hierarchy Schema of Interpreting Maps[71]

Maps, as previously stated, have various elements. These elements are required to make maps, and yet not all elements are useful to describe the contents of maps. The various elements of maps are summarized from the literature as follows:

1. Title

   The title is an important element to describe maps because it usually, represents the mapped area.[72] It is perceived as very important because users utilize it as a keyword to search the representative map. To some extent, however, titles do not reflect the content of maps; for instance, series maps, these maps use the same title in a series of maps. Moreover, there are various names of places that are alike. Thus, another element is needed to refine their search of maps, for instance, geographical references. Numerous maps have two titles: title and sub-title, therefore, librarians and archivists are suggested to write both titles.

[71] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps": 358.
[72] Anonym, *Fundamentals of General Cartography*, (Bangalore: Rai Technology University, 2009): 23.

2. Legend

   A legend is an element that provides users information about the symbols of maps. These symbols depict features of the landscape. Caitlin Dempsey contends that the legend is considered as the decoder for the symbols of spatial information.[73] This element is very crucial for map users to interpret map symbols.[74] However, it is considered unimportant element of map description because it reflects technical information about maps instead of context.

3. Colors

   A color symbol indicates the land use features on maps, for instance, the elevation of the ground, and the depth of seas and oceans. There are numerous colors for topographic map symbols, for instance, black, red, orange, green, and brown. Black, for instance, usually depicts buildings, and railways. It is also used for geographical names, geographical references, elevation, and border information. Brown depicts the area of sand and esker. It is also employed for depicting contour lines and elevation. [75] Even though color symbols represent the content of the topographic maps, it appears that this element cannot be used as element in describing maps. However, this information can be stated in the introduction of a finding aid or catalog in order to assist non-geographer/ cartographer users understand the contents of maps. There are standardized colors for various landscapes, for instance, blue and its degradation are used for water bodies, green is used for vegetation areas, and pastel colors for elevation. This element is considered unimportant because it does not inform the connectedness or context of maps as suggested by Thomas Barkowsky and Christian Freksa.[76]

4. Scale

   A scale is the ratio between the length on map and the actual length. This element is perceived as an important element since it determines the level of information. The bigger the scale, the more detailed information appears on the maps. Moreover, it determines the

[73] Caitlin Dempsey, "Elements of a Map." *GIS Lounge*, June 11, 2011, accessed February 1, 2017, http://www.chicagomanualofstyle.org/tools_citationguide.html.
[74] M. Bunch, *Guidelines for Producing Cartographic Output*, (Canada: York University, 2002), accessed February 27, 2017, http://www.yorku.ca/gis/es3520/docs/carto_conventions.pdf.
[75] Natural Resources Canada, "National Topographic System Maps," 2016, accessed February 20, 2017, https://www.nrcan.gc.ca/earth-sciences/geography/topographic-information/maps/9767.
[76] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps": 358.

interval elevation of contour lines. There are three types of scale: numeric, verbal, and pictorial scale. Topographic maps, mostly, utilize numeric and pictorial scale.

5. Orientation

   An orientation of maps is aimed at determining the direction of maps.[77] Generally, maps point towards the north. This element is considered unimportant element for describing topographic chart because it does not indicate the context of maps.

6. Projection

   Projection is a method for transforming the location of mapped area from the globe to the flat surface. There several types of map projections of which determined what kind of measurement of astronomical location. Cartographers and geographers consider this element very crucial before creating maps. Nevertheless, the projection is unimportant to describe maps because coordinates reflects its map projection and it has nothing to do with the context of maps.

7. Contour Lines

   A contour line is considered an important element for topographic maps. Moreover, it differentiates topographic maps from other types of maps. However, this element is not important as an element to describe maps. Furthermore, users do not use it as their keyword to search maps.

8. Date (s)

   Maps are resulted from complicated processes which involved expedition, surveying, measuring, calculating, drawing, and publishing/ printing. Thus, the date of production is considered an important element of map description because it depicted when maps were made. Users might also utilize this element to refine their search. Furthermore, it can be used to criticize maps based on historical approaches within the space.[78] Date can also be used to arrange maps.

9. Author/ Publisher

   The author or publisher represents a statement of copyright.[79] It also describes who is responsible for surveying or creating and publishing charts. This element is important for

[77] Caitlin Dempsey, "Elements of a Map."
[78] Nadia Charalambous and Ilaria Geddes, "Spatial Memory and Shifting Centrality." In *Suburban Urbanities: Suburbs and the Life of the High* Street, eds. Laura Vaughan, (United States: UCL Press, 2015): 79.
[79] M. Bunch, "Guidelines for Producing Cartographic Output."

users to notice who is in charge of mapping, and responsible for publishing the maps. Therefore, both archivists and librarians have to include this element in their map description.

10. Citation

    The citation provides some information, such as, data sources of maps, and surveyors. It appears that citation is important elements of map descriptions.

There are ten elements of maps that archivists and librarians should consider to describe maps originating from the *topografische dienst*. These are title, legend, colors, scale, orientation, projection, contour lines, date (s), authors/ publishers, and citation. Nevertheless, not all elements can be employed as elements to describe maps, such as, legend, colors, orientation, projection, and contour lines. These elements are possibly less important for users to search maps by using them because not all users have capabilities to interpret these elements. There are various map elements that can be used as elements for describing the maps originating from the *topografische dienst* and they are considered important. These are title, scale, date (s), authors/ publishers, geographical references and citation. These aforementioned elements might be easily understood by users in general and help them to refine their search. Nevertheless, numerous elements of maps description are needed to provide them information to access and consult the *topografiche dienst*'s maps. These are sheet number, language, and a brief summary of maps. Sheet number can likely be utilized as a tool to arrange *topografische dienst*'s maps. The suggested elements to describe maps originating from the *topografische dienst* are able to provide users the context of these maps.

The context of maps is important in creating finding aids of the *topografische dienst*'s maps. It is derived from the functions and activities of the *topografische dienst* as military topographic mapping agency during the nineteenth and the twentieth centuries. The functions and activities of this mapping agency were changed as the expanded functions of mapping. Maps of the *topografische dienst* reflect their varied functions. In order to preserve their context which is considered important, archivist and librarians who in charge manage the maps of the *topografische dienst* are required to understand the administrative history of the *topografische*

dienst. These maps were produced not only for military purposes, but also for politics, economics, urban planning, and colonization. These functions and activities were recorded in their archives of which consisted written-archives and maps. The functions of the *topografische dienst* can be used to organize its maps, hence archivists and librarians can provide users the context of these maps and both professions can produce user-friendly of the maps of the *topografische dienst*. In order to provide information of content of these maps, both archivists and librarians employ various elements of maps, for instance sheet numbers, language, size of charts, title, scale, date (s), authors/ publishers, and citation.

CHAPTER II.

THE *TOPOGRAFISCHE DIENST*'S MAPS IN THE NATIONAL ARCHIVES OF THE NETHERLANDS

The National Archives of the Netherlands (NAN) is the Dutch national archival institution. Like all archival institutions, it is obliged to manage archives as a research source for the benefit of society and to preserve the national collective memories.[80] The NAN holds numerous media from various provenances. They have 125.000 km of written-archives, 3.000.000 photographs, and 300.000 maps.[81] The *topografische dienst* is one of provenances that are currently kept and managed by the NAN. As previously discussed, it was a military mapping agency in the Netherlands. Moreover, it aimed at providing spatial information of the Netherlands and their colonies for various purposes. Thus, these maps came from in various provenances with different contexts.

The NAN keeps and manages the written-archives and maps of the *topografische dienst*. These archives were from the processes of creating, using-maintaining, and disposing. These processes are important to arrange and describe their archives, maps in particular, in order to preserve their context and deliver it to users. The NAN performs also archival management to enable access to users based on the archival principles: provenance and original order. Archival management encompasses acquisition, arrangement and description, preservation and access. There are numerous studies about archival management and its processes. To begin with Terry Eastwood, he contends that archival arrangement and description aim at detecting the numerous relationships evident in a body of archives and organizing them based on structures, functions, procedures, and activities of the creator agency. He also contends that description is aimed to explain these relationships and aggregations.[82] Margareth Hedstorm, in the second place, contends that the arrangement and description of archives can be considered as a bridge between the past and present.[83] Finding aids are the results of arrangement and description. Jennifer Edgecombe further defines a finding aid as a descriptive tool that depicts the physical and

[80] Michael Roper, et al., *Managing* Archives, (London: International Records Management Trust, 1999): 1.
[81] Frans van Dijk, "Digitization," Interviewed by Octavia Syafarwati and Rini Rusyeni, January 5, 2017.
[82] Terry Eastwood, "A Contested Realm": 8.
[83] Margareth Hedstorm, "Archives, Memory, and Interfaces with the Past." *Archival Science 2*(2002): 26-27.

intellectual control over the creator agency and help users to retrieve particular archives.[84] Thus, a finding aid should be user-friendly to users.

There are two finding aids for the collections of *topografische dienst* in the NAN which date from the seventeenth until the twentieth century. Both finding aids are categorized as inventories. These finding aids are separated based on the media of archives. The first inventory was created by H. den Hertog in 1982.[85] It is a finding aid of the textual-archives of the *topografische dienst* dating from the eighteenth until the twentieth century. Another inventory of the *topografische dienst* is for maps dating from the seventeenth until the twentieth century.[86] The separation between the two media makes the context of these archives difficult to ascertain. At the same time, the physical separation might have been deemed necessary for preservation purposes. The provisions of cross-references can maintain the integrity of the archives.

An archivist is a professional who is responsible to manage archives and provide access for users according to the archival principles. Sir Hillary Jenkinson contends that archivists are obliged to preserve the context and authenticity of archives, as cited by Sue Mc. Kemish in 1993. Sue Mc. Kemish further argues that archivists have to maintain the context of these maps by employing the archival principles and ensuring the continued usability of these maps to users.[87] With regard to the map archivists of the NAN, they have to follow the original arrangement of the *topografische dienst*. They also have to follow the principle of provenance. Since they have separated the archives according to the media of archives, written-archives and maps, the materials might lose the context of the *topografische dienst* because the information about cross-reference is only founded in the introduction part of the inventory of maps collection. In the long run, arrangement and description are considered as tools to maintain the context and provide access for the *topografische dienst*'s maps. Nevertheless, in some cases, the original arrangement of maps does not indicate the context of maps. This chapter aims at exploring and analyzing the arrangement and description of the *topografische dienst*'s maps that are kept and managed by the NAN. It also aims at examining the perspectives of archivists towards spatial information.

[84] Jennifer Edgecombe, "Finding Aids." In *Keeping Archives*, eds. Judith Ellis, (Australia: Thorpe, 1993): 248.
[85] H. den Hertog, *Inventaris van de Archieven van de Topografische Dienst en Rechtsvoorgangers (1789) 1814 – 1932 (1943); Collectie Krayenhoff, 1798 – 1811; Commissie De Mn, 1822 – 1827*.
[86] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst en Rechtsvoorgangers, (18e eeuw) 1814-1932 (1958)*.
[87] Sue McKemmish, "Introducing Archives and Archival Programs": 10.

2.1 The Arrangement of the *Topografische Dienst'*s Maps

Marijke Kok, a Dutch archivist at the NAN, employs the term *kaartenarchief* meaning "map archives" to describe the whole structured map archives from a given creator agency. She further contends that map archives are organized according to the tasks of the creator agency and they are unified in a body.[88] There are hierarchies in a map arrangement: *fonds*, series, files, and items.[89] However, these hierarchies are not obliged to be applied for all mapping agencies because they have different functions and activities of mapping. This sub chapter will analyze the organization of the *topografische dienst*'s maps.

There are 5.693 maps of the *topografische dienst* in the NAN dating from 1622 until 1958.[90] The maps of the *topografische dienst* consist not only of the maps they had produced but also maps that they had used and received from other institutions. These maps reflect their social and organizational context. This collection encompasses topographic, hydrographic, military, geologic maps, plans, and atlases. The Dutch Public Records Act 1962 was employed in acquiring these maps. The third article of this act stated that government bodies were obliged to ensure that their documents were accessible and in a good order and good condition before transferring their archives to the NAN.[91] Therefore, these maps might have been well organized by the *topografische dienst*. However, the acquiring process is not available in the finding aid of the *topografische dienst*'s maps.

The arrangement of map archives is according to the principle of provenance and original order. Kok suggests that the principle of provenance should be the first priority in arranging archives.[92] This principle is aimed at ensuring that no archives with a relevant context are mixed. Afterwards, the principle of original order is employed to arrange archives. The principle of original order depicts an arrangement of archives when they were created, maintained, and used by their creator agency. It also reflects hierarchical filing system consisting of various levels

[88] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 33-34.
[89] International Council of Archives, *General-International Standard Archival Description*: 13-17.
[90] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst*: 5.
[91] Benhard Mantel, "Acquisition of Analog Archives," Interviewed by Octavia, Raistiwar, and Rini Rusyeni, November 29, 2016.
Benhard Mantel is a senior acquisition officer in NAN and he is responsible for acquiring archives from government bodies, for instance, the Ministry of Defense, and General Accounting Chamber. In addition, the NAN also acquires archives from private records, companies, societies, and so on. He has experience as an archivist and archivist trainer.
[92] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 44.

including *fonds*, *subfonds*, series, subseries, files, and items.[93] The International Council on Archives (ICA) describes *fonds* as all of the archives that are created, accepted and used by a creator agency in any media. The ICA defines *series* as "documents arranged in accordance with a filing system or maintained as a unit because they result from the same accumulation or filing process, or the same activity; have a particular form; or because of some other relationships arising out of their creation, receipt, or use". A series is also known as a records series. A *file* is defined as a group of archives results from the same subject, activity, or transaction. It is also considered as a basic unit within the series.[94] An *item* is the lowest hierarchy of archival arrangement. The arrangement should be systematic, not only physically but also intellectually as suggested by James M. O'Toole and Richard J. Cox.[95]. Nevertheless, this hierarchy must be adjusted with the functions of the creator agency, as previously stated. Archivists, for the most part, utilize functions and activities of creating agencies to organize archives without losing context. In the eighteenth century, map archivists arranged cartographic materials, maps in particular, based on chronological order first and geographical order thereafter.[96] However, this arrangement did not follow the principle of original order and resulted in the loss of context, even though it was intended to improve accessibility. Archivists, currently, have to criticize the original arrangement of maps because it might not represent the functions of the mapping agencies and context of archives.[97] They also have to embrace their criticism in managing archives as suggested by James O'Toole and Richard J. Cox.

There are various arguments about the organizations of maps. Ralph E. Ehrenberg, first, argues that the appropriate method to arrange maps is based on the area with further subdivisions according to subject and date.[98] This argument is analogous to that of Marijke Kok. She believes that geographical order is a user-friendly system. However, this method might not accommodate maps made by a creator who had multiple subjects or goals in mapping. In addition, it suits a mapping agency that produced and received homogenous maps. The maps of the *topografische dienst* in the NAN are not appropriate for the application of this theory because they have various

[93] Geoffrey Yeo, "Debates about Description." In *Currents of Archival Thinking*, Eds. Terry Eastwood and Heather MacNeil, (California: ABC-CLIO, 2010): 92.
[94] International Council of Archives, *General-International Standard Archival Description*: 11.
[95] James M. O'Toole and Richard J. Cox, *Understanding Archives and Manuscripts,* (Chicago: The Society of American Archivists, 2006): 121-123.
[96] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 44.
[97] James M. O'Toole and Richard J. Cox, *Understanding Archives and Manuscripts*: 135.
98 Ralph E. Ehrenberg, *Archives and Manuscripts*: 20-21.

functions and activities and they consist of various types of maps. This arrangement does not fit with the multi purposes mapping agencies and heterogeneous map procedures because it might lose its context as archives. Furthermore, it might take more time for users like geographers and cartographers to find the exact maps they need. There are other arrangement criteria, such as themes of maps, alphabetical order of titles and authors, date (s), and scale.[99] However, these criteria might not be appropriate for arranging maps. Nevertheless, as previously mentioned, there is no fixed rule for organizing maps because each mapping agency has different functions and activities of mapping. By and large, arranging maps based on geographical order is considered fruitful to users and archivists, even when it does not follow the archival principles of provenance and original order. The maps might lose their context thus the archivists could be considered remiss in their duty to ensure the continued usability of the materials.[100] It might also lose its context and archivists are considered miscarriage in delivering continuing usability of maps. Another suggestion to arrange maps on the level series or lower is based on the sheet number of maps.

The title of the inventory of the *topografische dienst'*s maps is *Inventaris van het kaartenarchief van de Topografische Dienst en Rechtsvoorgangers, (18e eeuw) 1814-1932 (1958)*, meaning "Inventory of Map Archives of the Dutch Topographic Service and its Predecessors from the Eighteenth until the Twentieth Century". The levels of arranging these maps are *fonds*, *series*, *files*, and *items*. It has 22 series, 79 files and 5.693 items. As can be seen from the title, there other provenances of this collection. Furthermore, this inventory does not include the history of the *topografische dienst*'s predecessors, thus the context of maps and their relations are considered unclear. Therefore, the principle of provenance might be unsuccessfully applied within this inventory because they do not describe the relation between the *topografische dienst* and its predecessor, and what functions in common that they had. As previously stated, that the NAN divided the archives based on media of archives: textual archives and maps. The 22 series of the *topografische dienst*'s maps include:

1) *Hattinga Kaarten (ca. 1750),*
2) *Ferrariskaarten (1771-1778),*
3) *Militaire Verkenningen Belgie (1815-1840),*

[99] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 46-47.
[100] Sue McKemmish, "Introducing Archives and Archival Programs": 25.

4) *Verzameling Plans van Steden en Vestingwerken (the 17th – 19th century),*
5) *Atlas driehoeksmeting Krayenhoff (ca. 1820),*
6) *Schetsatlas Commissie De Man (1820-1827),*
7) *Veldminuten 1:25.000 Topografisch Militaire Kaart (1850-1864),*
8) *Nettekeningen 1:50.000 van de veldminuten t.b.v. de Topografisch Militaire kaart (1850-1864),*
9) *Nettekeningen 1:25.000 en 1:50.000 t.b.v. de Topografisch Militaire Kaart (1850-1864),*
10) *Veldminuten Chromo-Topografische Kaart in Bonneprojektie (1865-1940),*
11) *Chromo-Topografische Kaart in Bonneprojektie 1:25.000 (1865-1940),*
12) *Topografische en Militaire Kaart van het Koninkrijk der Nederlanden (T.M.K.) 1:50.000 (1844-1932),*
13) *Topografische Atlas 1:200.000 (ca. 1870-1950),*
14) *Geologische Kaarten van Nederland (ca. 1870-1958),*
15) *Collectie C.J. van de Graaff,*
16) *Atlassen,*
17) *Binnenlandse kaarten, niet behorend tot topografische kaartseries (the 19th – 20th century),*
18) *Rivierkaarten Nederland,*
19) *Topografische Kaart van het "Oostelijk Frontier" (ca. 1817),*
20) *Buitenlandse Kaarten (1744-1925), Oost- en West-Indië (the 19th – 20th century),*
21) *Koperplaten en Lithografische Stenen,*
22) *Chromo-Topografische Kaart in stereografische projektie 1:25.000,*
23) *Chromo-Topografische Kaart in stereografische projektie, 1:50.000*.[101]

As one might expect, these aforementioned series reflect the various functions of the *topografische dienst* and its predecessors. These were to provide information about spatial information for military purposes in particular but also for urban planning, cartography, geology, politics, mining, and colonization. This arrangement is unsystematic and inconsistent because it does not clearly delineate things such as the orders of the series, and levels of functions. Gijs

[101] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst*: 3-4.

Boink, the map archivist of the NAN who arranged and described the maps of the *topografische dienst* in 1992, explains that these series are according to the transfer sequences of the *topografische dienst*'s maps in the late 1980's. These map organizations reflect the original order during the map transference to the NAN, and they are considered as the arrangement of the maps originating from the *topografische dienst* even though these series are not systematic and consistent because there are no parameters in arranging these series. On the other hand, the map archivists of the NAN classified these maps according three categories: origin, printed products, and collected maps. The origin maps indicate the maps originating from the *topografische dienst* of which they did the survey, print and publish these maps. On the other hand, the printed product of maps indicate the maps of which printed by the *topografische dienst* whereas the collected maps are maps of which were received by other institutions. These collected maps can be found in the maps and atlases dating from seventeenth until eighteenth centuries. Boink informs that these categories and the former will be used for the coming maps of the *topografische dienst* by using cross-references. [102] Nevertheless, these categories do not reflect the context of the *topografische dienst*.

There are various elements used to organize the *topografsiche dienst*'s maps on the level of files, such as area, date, and scale. The main consideration for choosing one from three aforementioned variables is the context for each function that is depicted on maps. The use of geographical areas as divisions of files is suitable for military, and political uses, as well as mining and colonization. Arguably, these purposes related to the authority and power of the Dutch government during the nineteenth and the twentieth century. The geology purpose of mapping employs the scale to organize its maps due to the detail information that they needed. Finally, chronological order within the series is utilized by the cartography and hydrology. It might have been aimed at investigating the transformation of aforementioned purposes through time. O'Toole and Cox contend that archivists can re-arrange archives as part of criticism of the archives. By observing the inventory of the *topografische dienst*'s maps, it appears that the map archivists of the NAN do not change the original schema of the *topografische dienst*. Nevertheless, a few revisions towards this arrangement need to be done in order to make it more systematic and consistent.

[102] Gijs Boink, "topografische dienst."

Arrangement is one of the processes in making finding aids of the maps originating from the *topografische dienst* in the NAN. Context of producing and collecting maps plays important role in arranging maps of the *topografische dienst*'s maps. The context of these maps is reflected by their map subjects. The principles of provenance and original order also contribute in organizing these maps. The hierarchy of arrangement of the *topografische dienst*'s maps consists of *fonds*, series, files, and items. There are various elements to organize these maps, for instance, subject, area, date, and scale. The first element that is employed to divide maps as series is the subject. The map subjects represent the functions of the *topografische dienst* during the nineteenth and twentieth century. These functions are analogous with the transformation of the *topografische dienst* as previously discussed such as military, urban planning, cartography, geology, politics, mining, and colonization purposes of mapping. However, the organization of series is considered unsystematic and inconsistent. Even though this arrangement represents the original order and context of archives, archivists are expected to rearrange these maps to make it more systematic and consistent. Thus, this finding aid should be more user-friendly. This finding aid consists of *fonds*, series, files, and items as their hierarchy of arrangement. There are three elements used to arrange these materials, such as, subject, area, date, and scale. The first parameter to group maps into series is based on the subjects of the maps. These subjects depict the various aforementioned functions of mapping. Arguably, the suggestion of Ralph E. Ehrenberg and Marijke Kok to organize maps based on geographical area on the first level of arrangement cannot be applied for the maps of the *topografische dienst* in the National Archives of the Netherlands because it might lose its context and interrelatedness with the written-archives. This arrangement method suits with the mapping agency which has a single function of mapping. Geographical are and chronological order, as well as scale, are indicators to organize maps on the level of *files*. The consideration of choosing this indicator is based on the purpose of a certain subject. The arrangement of the *topografische dienst*'s maps, in general, does not lose it context because it depicts various functions of this mapping agency. On the other hand, the map archivists of the NAN classified these maps into categories: origin, printed products, and collected maps. However, they are also obliged to preserve the original order of the *topografische dienst*'s

maps.[103] Thus, they utilize cross-references to link between the original order of these maps and their own map classification. Nevertheless, this finding aid would benefit from a few revisions to make it more systematic and user-friendly. It can be suggested that the map archivists of the NAN can employ chronological order, subject, and further geographical area to arrange these maps systematically and consistently without losing the context of the *topografische dienst*'s maps.

2.2 The Description of the *Topografische Dienst*'s Maps

The General-International Standard Archival Description (ISAD-G) defines archival description as the making process of a precise representation of archives by capturing, analyzing, organizing, and recording information.[104] Geoffrey Yeo contends that archival description is aimed at assisting users in locating their specific archives. It is important for the purposes of not only users but also preservation. Not all archives can give explicit information about their context but archivists can reveal and describe the interrelatedness of archives by doing research about the institution.[105] Describing maps also triggers archivists to learn how to interpret these maps. Inevitably, geographical and cartographical knowledge are considered important for archivists to depict the spatial information of these maps. Additionally, it might help archivists to organize the context of the maps of the *topografische dienst*.

The inventory of the *topografische dienst*'s maps was created in 1992 by two map archivists of the NAN: G.G.J. Boink and K. Zandvliet. Both archivists described these maps before the establishment of the ISAD-G by the International Council on Archives (ICA) in 1999.[106] The *topografische dienst*, as previously discussed, holds not only topographic maps, but also other types of maps as the consequence of varied functions of the *topografische dienst* during the nineteenth and the twentieth centuries. These maps have numerous symbols to depict the condition of certain areas. Thus, archivists are obliged to be able to interpret topographic maps in order to provide correct information about these maps due to its contents. In this sub

[103] Gijs Boink, "topografische dienst."
[104] International Council on Archives, *International Standard for Describing Institutions with Archival Holdings*, (France: International Council on Archives, 2008): 12.
[105] Geoffrey Yeo, "Debates about Description": 89-90.
[106] International Council of Archives, *General-International Standard Archival Description*: 2.

chapter, I am going to analyze the description of the *topografische dienst*'s maps that are kept and managed by the NAN and various arguments from the literature.

Map descriptions should be consistent so that users do not have any difficulties to access and consult the maps. There are various studies related with describing maps. Marijke Kok, for example, argues that archival description can facilitate users in finding their specific archives. However, she contends that

"*De identificatie, die in bibliotheeken een belangrijke drijfveer tot beschrijving van kaarten en boeken is, spelt in de archiven een veel onbeduidender rol. Dit vooreerst omdat de meeste archiefstukken uniek zijn en een identiek-zijn met een bestaande beschrijving niet kan worden vastgesteld,*"

identification has unimportant roles for archivists to describe maps because it does not reflect their uniqueness. Furthermore, the uniqueness of the *topografische dienst*'s maps is called into doubt because there is no interrelatedness between written-archives and maps. Additionally, existing description cannot be determined to all kind of archives.[107] Terry Eastwood further argues that archivists should identify the background of the archives' creation.[108] This argument is analogous with that of Thomas Barrowsky and Christian Freska who contend that the context of maps plays important role in describing maps.[109] When it comes to topographic maps, there are numerous features that need to be identified.

Eric Ketelaar (1997) contends that archivists cannot start their works by employing universal guiding or other international standards.[110] Even though they have an archival description standard called the ISAD-G, they must first understand the context of the archives before providing information by describing archives. It allows other national archival standards to be involved in describing archives based on national policy. The main aim of ISAD-G is to identify and describe the context and content of archives in order to provide access for users.[111] In this case, map archivists are obliged to discern the context of the *topografische dienst* as a mapping agency. Moreover, they have to know what kinds of users utilize these maps. Due to the

[107] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 36.
[108] Terry Eastwood, "A Contested Realm": 4.
[109] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps": 358.
[110] Terry Eastwood, "A Contested Realm": 3.
[111] International Council of Archives, *General-International Standard Archival Description*: 7.

mission of the NAN as a house of memories for the whole society, they have to accommodate all of society's interests instead of solely historians. As previously stated, there are nine suggested description elements of maps. These are sheet number, title, short description, date, author, scale, language, size, astronomical or geographical position, and citation / cross reference. In order to avoid repetition of the same information, there are likely various elements that can only be described at level of *fonds*, series or files. These are scale, size, and language.

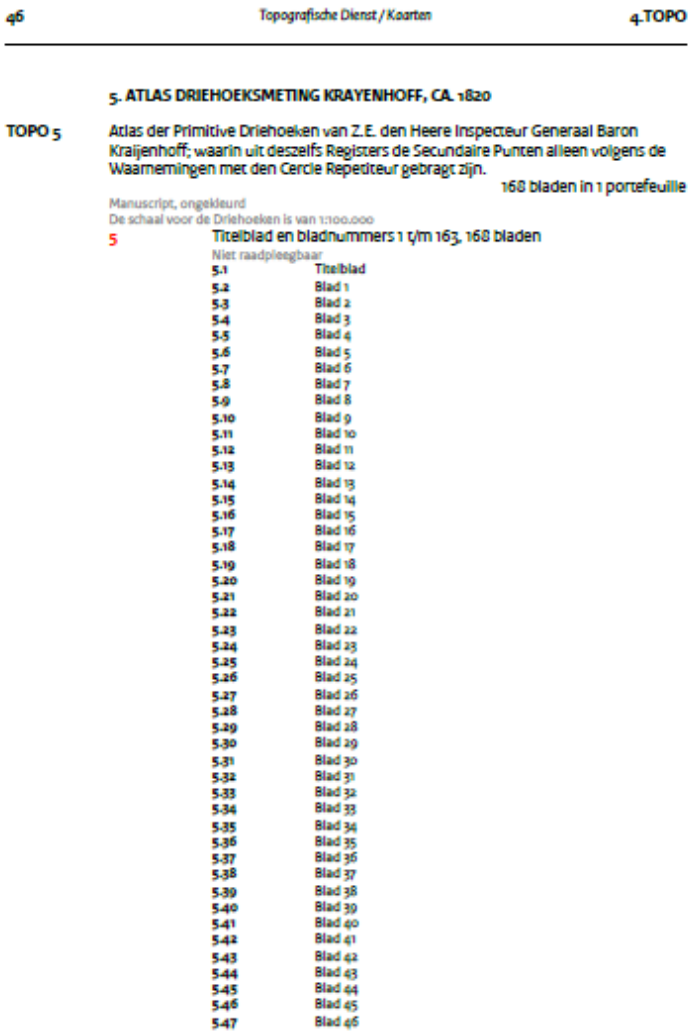
The ISAD-G has seven areas of descriptions. These are identity statement, context, content and structure, conditions of access and use, allied materials, notes, and description control. The mandatory elements are reference code, title, creator, date (s), extent of the unit of description, and level of description. On the item level, it has four elements of description: reference code, title, creator, and date(s). The description elements of the ISAD-G in general are considered unspecific to provide the contents, spatial information in particular of the *topografische dienst*'s maps. Even though this finding aid did not utilize the ISAD-G, it almost fulfills the mandatory elements but it does not include the acquisition history of these maps. There are various levels description in this inventory, such as, *fonds*, *series*, *files* and *items* as suggested by the ISAD-G.[112] The description on the level of *fonds* is depicted in the introductory part of the inventory.[113] It also contains the cross-reference/ citation on all levels of description.

Marijke Kok proposes various descriptions for map archives in her article entitled *Beschrijving en Ordening van Kaarten in het Archief*, meaning "Description and Arrangement of Maps in Archives." Her suggestions are mostly employed by the NAN to provide information about the maps of the *topografische dienst*.[114] She first suggests five elements of description, including, *redactie, inhoud, datum, ontwikkelingsstadium*, and *uiterlijke vorm*. *Redactie* is the form of archives, for example, a letter, decree, etc. This element can be employed to describe the types of maps of the *topografische dienst*, for instance, topographic, thematic, and geo-reference maps. It can be used on the level of series or files. The *inhoud* explains the contents of the spatial information of maps.[115] This element can be used for all levels of description. The lower hierarchy of description, the more detail information provided by archivists. It is analogous with the suggested aforementioned elements. The *datum*, meaning date, gives information about the

[112] International Council of Archives, *General-International Standard Archival Description*: 8-12.
[113] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst*: 4-7.
[114] Ron Guleij, "Map Descriptions," interviewed by Octavia, February 20, 2017.
[115] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 36-37.

published or surveyed dates, depends on the available information of maps of the *topografische dienst*. The *ontwikkelingsstadium* represents the development of archives of archives, for instance original, minutes, or copy. The *uiterlijke vorm*, meaning the outer form, represents the physical appearance of archives, for instance, binding. With regard to the maps of the *topografische dienst*, this element is not especially important because this collection has only a few bound maps, called *atlasess*.

For the most part, the inventory of the *topografische dienst*'s maps uses title, date, and scale as their elements to describe the maps of the *topografische dienst*. Figure 3 indicates that titles are considered unclear for users because they do not specify the mapped areas.



46 Topografische Dienst / Kaarten 4.TOPO

5. ATLAS DRIEHOEKSMETING KRAYENHOFF, CA. 1820

TOPO 5 Atlas der Primitive Driehoeken van Z.E. den Heere Inspecteur Generaal Baron Kraijenhoff; waarin uit deszelfs Registers de Secundaire Punten alleen volgens de Waarnemingen met den Cercle Repeditteur gebragt zijn.
168 bladen in 1 portefeuille

Manuscript, ongekleurd
De schaal voor de Driehoeken is van 1:100.000

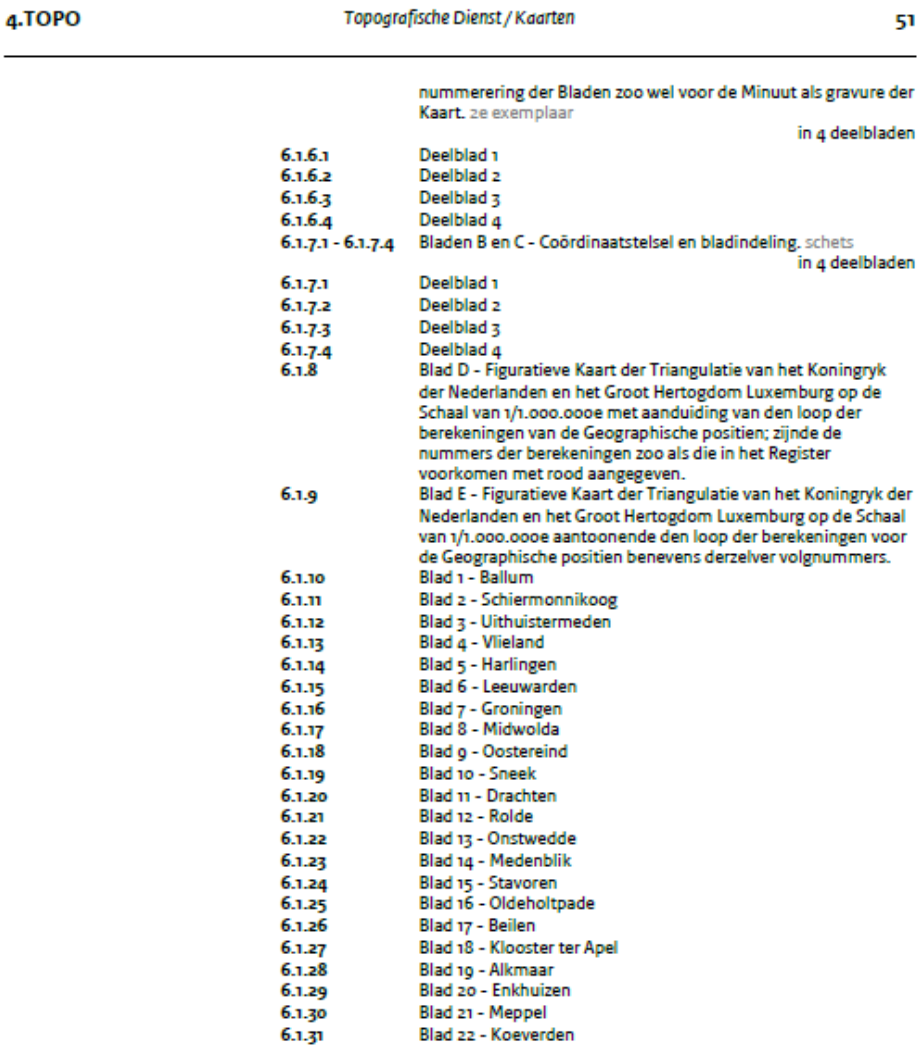
5 Titelblad en bladnummers 1 t/m 163, 168 bladen
Niet raadpleegbaar

5.1	Titelblad
5.2	Blad 1
5.3	Blad 2
5.4	Blad 3
5.5	Blad 4
5.6	Blad 5
5.7	Blad 6
5.8	Blad 7
5.9	Blad 8
5.10	Blad 9
5.11	Blad 10
5.12	Blad 11
5.13	Blad 12
5.14	Blad 13
5.15	Blad 14
5.16	Blad 15
5.17	Blad 16
5.18	Blad 17
5.19	Blad 18
5.20	Blad 19
5.21	Blad 20
5.22	Blad 21
5.23	Blad 22
5.24	Blad 23
5.25	Blad 24
5.26	Blad 25
5.27	Blad 26
5.28	Blad 27
5.29	Blad 28
5.30	Blad 29
5.31	Blad 30
5.32	Blad 31
5.33	Blad 32
5.34	Blad 33
5.35	Blad 34
5.36	Blad 35
5.37	Blad 36
5.38	Blad 37
5.39	Blad 38
5.40	Blad 39
5.41	Blad 40
5.42	Blad 41
5.43	Blad 42
5.44	Blad 43
5.45	Blad 44
5.46	Blad 45
5.47	Blad 46

Figure 3. Inventory of the *Topografische Dienst*'s Maps [116]

[116] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst*: 46.

The titles can be supplemented with other elements, for instance, the most important geographical name of a map (see figure 4). Language is another description element included in the ISAD-G. It is a part of the conditions of access and use area.[117] There are various languages of maps in this finding aid, such as Dutch, Latin, German, French and English. However, this finding aid only mentions Dutch as the language of these maps.



4.TOPO — *Topografische Dienst / Kaarten* — 51

	nummerering der Bladen zoo wel voor de Minuut als gravure der Kaart. ze exemplaar
	in 4 deelbladen
6.1.6.1	Deelblad 1
6.1.6.2	Deelblad 2
6.1.6.3	Deelblad 3
6.1.6.4	Deelblad 4
6.1.7.1 - 6.1.7.4	Bladen B en C - Coördinaatstelsel en bladindeling. schets
	in 4 deelbladen
6.1.7.1	Deelblad 1
6.1.7.2	Deelblad 2
6.1.7.3	Deelblad 3
6.1.7.4	Deelblad 4
6.1.8	Blad D - Figuratieve Kaart der Triangulatie van het Koningryk der Nederlanden en het Groot Hertogdom Luxemburg op de Schaal van 1/1.000.0000 met aanduiding van den loop der berekeningen van de Geographische positien; zijnde de nummers der berekeningen zoo als die in het Register voorkomen met rood aangegeven.
6.1.9	Blad E - Figuratieve Kaart der Triangulatie van het Koningryk der Nederlanden en het Groot Hertogdom Luxemburg op de Schaal van 1/1.000.0000 aantoonende den loop der berekeningen voor de Geographische positien benevens derzelver volgnummers.
6.1.10	Blad 1 - Ballum
6.1.11	Blad 2 - Schiermonnikoog
6.1.12	Blad 3 - Uithuistermeden
6.1.13	Blad 4 - Vlieland
6.1.14	Blad 5 - Harlingen
6.1.15	Blad 6 - Leeuwarden
6.1.16	Blad 7 - Groningen
6.1.17	Blad 8 - Midwolda
6.1.18	Blad 9 - Oostereind
6.1.19	Blad 10 - Sneek
6.1.20	Blad 11 - Drachten
6.1.21	Blad 12 - Rolde
6.1.22	Blad 13 - Onstwedde
6.1.23	Blad 14 - Medenblik
6.1.24	Blad 15 - Stavoren
6.1.25	Blad 16 - Oldeholtpade
6.1.26	Blad 17 - Beilen
6.1.27	Blad 18 - Klooster ter Apel
6.1.28	Blad 19 - Alkmaar
6.1.29	Blad 20 - Enkhuizen
6.1.30	Blad 21 - Meppel
6.1.31	Blad 22 - Koeverden

Figure 4. Figure X. Inventory of the *Topografische Dienst*'s Maps [118]

There appear to be inconsistencies among the description elements in this inventory. Arguably, it is caused by the information availability of these maps. The *inhoud*, meaning content is

[117] International Council of Archives, *General-International Standard Archival Description*: 26-29.
[118] Gijs G.J Boink and K. Zandvliet, *Inventaris van het Kaartenarchief van de Topografische Dienst*: 51.

employed to describe maps on all levels, as suggested by Marijke Kok. Nevertheless, it appears that the authors of this finding aid provide detailed information about maps of particular series. These series related to the important functions of the *topografische dienst* for water management, economics, geo-political, and colonization purposes. These series encompass information about Dutch cadaster maps in the nineteenth and the twentieth century (*Binnenlandse Kaarten*, 19de-20ste *Eeuw* and *Chromo-Topografische Kaart in Stereografische Projektie*), topographic condition of Belgium, Germany, and France (*Buitenlandse Kaarten*), and Dutch Colonization in the East and West Indies (*Oost-en West-Indië*, *19e – 20e*). Why do the archivists of the *topografische dienst*'s maps do not describe military maps in detail? It appears that they considered that the primary function of the *topografische dienst* was for the Dutch government. Moreover, the map archivists of the NAN do not consider geographers and cartographers as their users since they do not put much spatial information in this inventory, such as the astronomical of the maps. This metadata is considered important for an interactive finding aid using an interactive map as suggested by Lisa R. Johnston and Kristi L. Jensen as can be seen in figure 5.[119]

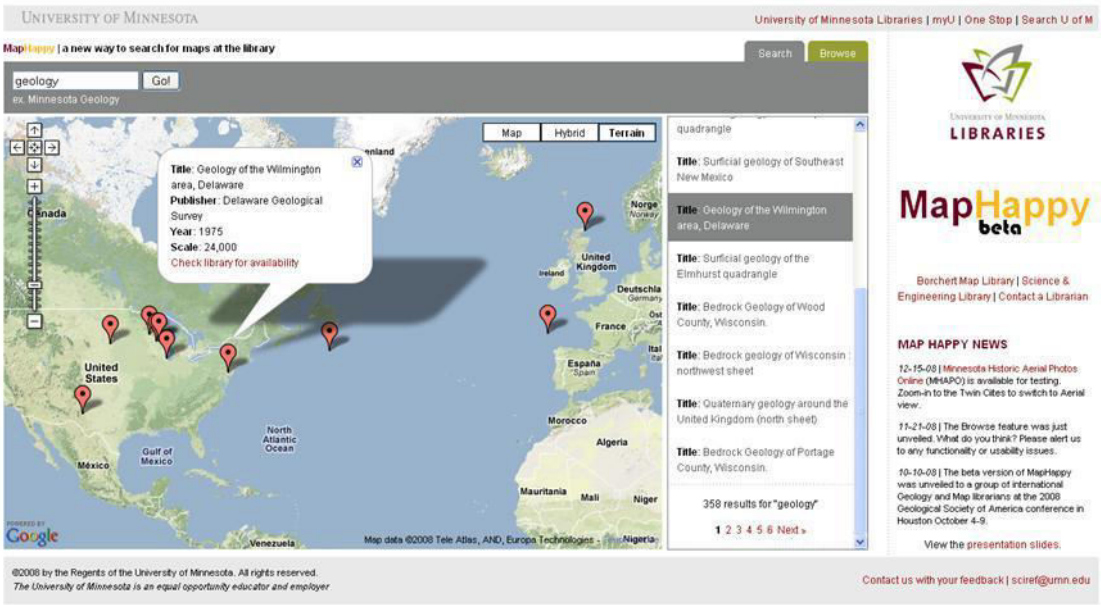


Figure 5. A Retrieval Aid Based using an Interactive Maps

[119] Lisa R. Johnston and Kristi L. Jensen, "Map Happy": 121-125.

A citation or cross-reference is also used on the level of item, and yet it is aimed at preserving the interrelationships within these maps In the case of the NAN, the interrelation between written-archives and maps of the *topografische dienst* is unclear, and therefore the context of these maps might be lost.

Arrangement and description are a business process of archival management that results in the creation of finding aids according to the principles of provenance and original order. There are two finding aids or inventories of the *topografische dienst* based on media of archives: written-archives and maps. This separation obscures the context of the *topografische dienst* and interrelatedness of both archives and users have to uncover the context by themselves. The arrangement of the *topografische dienst*'s maps follows the original order because of the Dutch Public Records 1962 that obliged government institutions to transfer their archives to the NAN in a good condition, and ordered. Moreover, the series of the *topografische dienst*'s maps reflect the transfer sequences of these maps to the NAN. The arrangement of these maps depicts the subjects of these maps that illustrated the functions of the *topografische dienst* as previously mentioned in the first chapter, even though it is unsystematic and inconsistent. There is another function of this collection as geo-reference maps. The hierarchy filing of these maps consists of *fonds*, *series*, and *files*. Subjects of maps are the parameters to determine the series levels. These subjects represent the functions of the *topografische dienst*'s maps. The agency's function was to provide geographical information primarily for military purposes but also pertaining to geology, geo-politics, education, mining, and colonization as well as map references. Geographical area, scale, and date are elements to determine the arrangement of maps on the level of files. Thus, the arguments of Ralph E. Ehrenberg to employ area-subject-date as an arrangement of maps[120] cannot be applied for the *topografische dienst*'s maps. With reference to the arrangement of the topografische dienst's maps, re-arrangement is needed by employing the chronological order, map subjects and further geographical order in order to make its arrangement systematic and consistent without losing its context.

Description has an important role in delivering information to users with respect to the archival principles. It also requires the depiction context of *topografische dienst*'s maps that

[120] Ralph E. Ehrenberg, *Archives and Manuscripts*: 20-21.

according to Thomas Barkowsky and Christian Freska, the most crucial element for describing.[121] The General-International Standard Archival Description (ISAD-G) as a standard description of archives might not be able to describe maps since it is possibly aimed for the textual-archives. The suggested elements might be needed in order to describe maps well. Nevertheless, the finding aid of the *topografische dienst*'s maps in general does not employ some of suggested description elements of maps, for example, sheet number, size, and geographical position. Hence, it might be considered an unfriendly finding aid for users, particularly geographers and cartographers. This inventory also has inconsistencies in the provision of information about maps which might be a result of the quantities of available information. Moreover, important functions of the *topografische dienst* might trigger the archivists of the NAN to deliver information to users. Hence, it appears that revising this finding aid is necessary to make a user-friendly finding aid and to acquire better metadata for the Encoded Archival Description.

[121] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps": 358.

CHAPTER III.

THE *TOPOGRAFISCHE DIENST*'S MAPS IN THE LIBRARY OF LEIDEN UNIVERSITY

The main goal of the Leiden University library (UBL) is to facilitate the university's staff and student's research and education. [122] Thus, it provides wide-ranging information for its clienteles. It was founded in 1575, and currently holds more than 5,2 million paper volumes and ten thousand magazines.[123] It also curates special collections. The UBL has various media in their special collections, for instance, books, photographs, microfilms, manuscripts, archives, prints, architectural drawings, audio-visual materials, and maps. Various cartographic collections are from the former library of the *Koninklijk Instituut voor de Tropen* (KIT), meaning the Royal Tropical Institute, and the special collections of the *Koninklijk Instituut voor Taal-Land- en Volkenkunde* (KITLV), meaning the Royal Netherlands Institute of Southeast Asian and Caribbean Studies, and the personal collection of Johannes Tiberius Bodel Nijenhuis, known as the Bodel Nijenhuis' collection.[124] The cartographic collections that hold the maps of the *topografische dienst* are the collections of Bodel Nijenhuis, the KIT, and KITLV.[125] These collections reflect different contexts in collecting maps which are not only fruitful for librarians in arranging and describing maps, but also for users to criticize the maps of the *topografische dienst*.

Lam Ngo, a map librarian of the UBL, argues that there are four phases of special collection's management in the UBL, include selection/ acquisition, cataloging, digitization, and access.[126] Arguably, these phases are analogous with the business processes of the archival management, including, acquisition, arrangement and description, preservation, and access. Libraries have a policy, known as collection-development. This policy aims at selecting their bibliographic materials based on various considerations. These are clientele's needs, budget and

[122] Universiteit Leiden, "Our Mission," accessed March 15, 2017, https://www.library.universiteitleiden.nl/about-us/library-organisation.
[123] Universiteit Leiden, "Collections," accessed March 15, 2017, https://www.library.universiteitleiden.nl/about-us/library-organisation.
[124] Universiteit Leiden, "Cartographic Collections," accessed March 4, 2017, https://www.library.universiteitleiden.nl/subject-guides/cartographic-collections.
[125] Martijn Storms, "Topografische Dienst."
[126] Lam Ngo, "Special Collections of the Leiden University's Library," interviewed by Octavia, March 14, 2017.

financial support, the strengths and weaknesses of a collection, and storage capacity.[127] Lam Ngo also reports that the UBL has a matrix as their tool to select what kind of collections that are going to be acquired. This matrix is arranged based on the goals of the UBL and historical approaches. There are two methods of acquisition in the UBL: purchase and donation.[128] There are various types of maps in the library of Leiden University. One of them is topographic maps which are mostly originating from the *topografische dienst*. Martijn Storms, the map curator of the special collection division of the UBL, informs that these maps are classified as colonial maps.[129] Therefore, librarians of the UBL might classify these maps according to a certain element of maps, for instance, geographical area, chronological order, or scale.

The maps of the *topografische dienst* are parts of special collections of the UBL which are managed by their librarians. There are more than 2.000 inventory numbers of maps originating from the *topografische dienst* from period 1883 until 1990. Storms informs that the methods of acquiring the *topografische dienst*'s maps are donation and transfer.[130] He also says, as previously mentioned, that there are three main collections in the UBL that hold *topografische dienst*'s maps; including Bodel Nijenhuis, the KIT and KITLV. He further states that these collections contain more maps than only the *topografische dienst*'s maps.[131] The collection of Bodel Nijenhuis was donated to the UBL in the nineteenth century. [132] In contrast, the collection of the KIT is donated to the UBL in 2013 and the KITLV transferred their maps to the Leiden University in 2014.[133] Nevertheless, the UBL does not inform the users about the acquisition history of the maps originating from the *topografische dienst* via the inventory of these collections. Thus, the users of these maps might not know about the context of these maps. In addition, Patricia A. Moore suggests that librarians should give the information about the acquisition of topographic maps a high priority because it is a starting point of the collection management.[134] The maps of the *topografische dienst* are currently held and managed by the UBL are aimed at providing sources for research instead of commercial purposes. The UBL considers the maps of the *topografische dienst* as published materials instead of archives, thus,

[127] Mary Lynette Larsgaard, *Map Librarianship*: *2.*
[128] Lam Ngo, "Special Collections of the Leiden University's Library."
[129] Martijn Storms, "Topografische Dienst."
[130] Martijn Storms, "Topografische Dienst."
[131] Martijn Storms, "Topografische Dienst."
[132] Martijn Storms, "Topografische Dienst."
[133] Martijn Storms, "Topografische Dienst."
[134] Patricia A. Moore, "Topographic Maps in US Libraries," *International Library Review* 19 (1987): 203.

they do not arrange these maps based on the functions of the *topografische dienst* from the nineteenth until the twentieth century. He further informs that the map curator of the UBL considers the maps of the *topografische dienst* as end products like other maps from other map collection. [135] They also consider these maps as colonial maps, as previously stated. They do not neither consider the contexts of the three map collections to arrange maps. However, Mary Lynette Larsgaard contends that librarians should provide the context of cartographic collections in order to engage users with maps.[136]

The librarians or map curators of the UBL are expected to understand the context of their map collections because it is part of the acquisition policy of libraries and help them to curate these maps.[137] It indicates that context of the three aforementioned map collections are important for map librarians of the UBL to provide user-friendly retrieval aids of the maps of the *topografische dienst*. The maps of the *topografische dienst* which are kept and managed in the UBL mapped the regions of the Netherlands, Dutch East Indies, *Nederlandse Nieuwe* Guinea (Dutch New Guinea), East Timor, and West Indies. The subjects of these maps are topographic maps and *schetskaarten* (sketch maps), *bladwijzer*, *overzichtskaarten* (overview maps), *gemeentenkaarten* (government maps), *stadskaarten* (city maps), hydrologic, tourism, and geologic maps, as well as *garnizoenskaarten* (garrison maps).[138] These aforementioned subjects reflect the functions of the *topografische dienst* date from the nineteenth until the twentieth century, like military, politics, urban planning, and colonization. In this case, the functions of each collection reflect the context of the *topografische dienst*'s maps in the UBL. In this chapter, I am going to study the arrangement and description of the *topografische dienst*'s maps in the UBL that are available on the collections of Bodel Nijenhuis, the KITLV, and KIT.

[135] Martijn Storms, "Topografische Dienst."
[136] Mary Lynette Larsgaard, *Map Librarianship*: xix.
[137] Mary Lynette Larsgaard, *Map Librarianship*: 3.
[138] Universiteit Leiden, "Topografische Dienst," accessed March 16, 2017, http://catalogue.leidenuniv.nl/primo_library/libweb/action/search.do?ct=facet&rfnGrpCounter=1&frbg=&&fn=search&indx=1&dscnt=0&scp.scps=scope%3A(UBL_DSPACE)%2Cscope%3A(%22UBL%22)%2Cscope%3A(UBL_DTL)%2Cscope%3A(UBL_ALMA)%2Cprimo_central_multiple_fe&tb=t&mode=Basic&vid=UBL_V1&ct=search&srt=rank&tab=all_content&dum=true&vl(freeText0)=topografische%20dienst&dstmp=1489670879936&fctIncV=maps&mulIncFctN=facet_rtype&rfnIncGrp=1.

3.1 The Arrangement of the *Topografische Dienst*'s Maps

There are two phases in arranging bibliographic materials. These are cataloging and classification. These phases differentiate library from archival science. As previously mentioned, Koehler argues that maps must be arranged logically in order to provide a user-friendly access.[139] Therefore, librarians can produce a user-friendly finding aid. Both cataloging and classification control the intelligibility and findability of bibliographic materials.[140] There are various scholars who study bibliographic cataloging. C.B. Hagen, first, defines cataloging as "the abstraction and the representation of a number of significant and identifying characteristics of the materials."[141] Afterwards, David A. Cabonero and Russel B. Dolendo contend that cataloging is a crucial process for libraries to deliver access to users and organize their collections within the libraries.[142] On the other hand, Wallace Koehler defines the classification system as a tool to inventory bibliographic collections, thus users can retrieve their finding easily.

There are numerous studies of map cataloging and classification according to the perspectives of the library science and geography. In the first place, the American librarians, Lisa R. Johnston and Kristi L. Jensen contend that the evolution in arranging and describing maps has the same pattern with books and other library materials; hence it results on the limitation of descriptions on geospatial objects.[143] On the other hand, a geographer and a map librarian, S. W. Boggs and Dorothy C. Lewis suggest that the maps classification system differs from books. They also contend that geographical science must be involved in developing a system of classifying and cataloging maps because geographical science accommodates a perspective of users.[144] The maps of the *topografische dienst* are considered by the librarians of Leiden University as published maps. This sub chapter considers the arrangement the maps of the *topografische dienst* that are managed by the UBL.

The goals of map cataloging are numerous. First of all, P. Ratsma contends that there are various goals of the map cataloging: to provide a structure overview of a collection, to verify

[139] Wallace Koehler, *Ethics and Values in Librarianship*: 18-19.
[140] David A. Cabonero and Russel B. Dolendo, "Cataloging and Classification Skills of Library and Information Science Practitioners in Their Workplaces: A Case Analysis." *Library Philosophy and Practice* (2013): 963, accessed March 17, 2017, http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=2337&context=libphilprac.
[141] C. B. Hagen, "An Information Retrieval System for Maps." *UNESCO Bulletin for Libraries*20 (1966): 32.
[142] David A. Cabonero and Russel B. Dolendo, "Cataloging and Classification Skills of Library and Information": 961-963.
[143] Lisa R. Johnston and Kristi L. Jensen, "Map Happy": 114-115.
[144] Samuel Whittemore Boggs and Dorothy Cornwell Lewis, *Classifications and Cataloging of Maps and Atlases*: i.

maps about the presence of a collection, to retrieve bibliographic materials as soon as possible, and to provide information about the description of bibliographic materials.[145] Secondly, Mary Lynette Larsgaard argues that the purpose of map cataloging is to make bibliographic materials available and accessible by making a surrogate representative of information on actual item, and making a single entity of bibliographic collection that distinguishes it from others. Therefore, curating maps individually differentiates librarians from archivists even though both professions aim at producing user-friendly retrieval aids.

There are numerous approaches to catalog maps. The Special Libraries Association, first, suggests that the area, subject, scale and size are elements to catalog maps.[146] However, in the case of the maps originating from the *topografische dienst*, size is considered an unimportant element in a map organization because they mostly have similar size within the same series. In the second place, a map librarian, Christopher Edmond Merret suggests that the authorship can be employed to catalog historical maps like the *topografische dienst*'s maps. He also suggests provenance as a criteria for cataloging maps.[147] The ISAD-G defines provenance as the liaison between documents and institutions or individuals that created, used, and maintained as the results of their activities and functions.[148] Finally, Boggs and Lewis argue to catalog or arrange maps based on the continuation of maps production.[149] This argument is almost analogous with the argument of Merret. Boggs and Lewis suggest that cataloging maps as a unit is appropriate for the complete or continuum collections. Arguably, the principle of original order can be applied to catalog the maps of the *topografische dienst*. Furthermore, maps should be cataloged as a single sheet for a particular interest of mapping.[150]

Mary Lynette Larsgaard contends that the bibliographic classification systems of maps aim at locating and retrieving bibliographic materials.[151] Consequently, a classification scheme should be consistent and predictable.[152] Geographical area is considered as the best element to

[145] P. Ratsma, "Ordening en Ontsluiting." In *Handleiding voor het Beheer van een Topografisch-Historische Atlas*, eds. P.Ratsma and C.C.S. Wilmer, (Hilversum: Stichting Archiefpublikaties, 1988): 132.
[146] Mary Lynette Larsgaard, *Map Librarianship*: 158.
[147] Christopher Edmond Merret, *Map Cataloguing and Classification*: 7-10.
[148] International Council of Archives, *General-International Standard Archival Description*: 10.
[149] Samuel Whittemore Boggs and Dorothy Cornwell Lewis, *Classifications and Cataloging of Maps and Atlases*: 15-21.
[150] Patricia A. Moore, "Topographic Maps in US Libraries": 204.
[151] Mary Lynette Larsgaard, *Map Librarianship*: 117.
[152] Christopher Edmond Merret, *Map Cataloguing and Classification*: 21.

classify the maps because it is the most-used keyword of searching of maps. There are two phases of classification of the maps as suggested by Laarsgaard. The first step is to scrutinize the purpose of arranging maps. Librarians aim at providing access because they have a motto "if we can find it, you can use it".[153] Therefore, the librarians of the UBL organize maps according to the geographical area because it reflects a logic and systematic method of map arrangement. With reference to the maps of the *topografische dienst*'s in the UBL, the context of these map collections are scattered because it does not depict the functions of this mapping agency. The context of the three map collections is also difficult to determine. The last phase of making map classification is to determine the kind of classification standards, for example, the Library of Congress subject headings, Dewey decimal classification, and Boggs and Lewis classification system.[154] The output map classification is call number of maps. The Library of Congress subject heading is mostly employed by librarians for managing their collection as contended by Christopher Edmond Merret (1976).[155] Maps, generally, are classified as a part of *G* section which encompasses geography, maps, anthropology, and recreation.[156] Therefore, librarians might emphasize geographers or cartographers as their main users by delivering map elements as their description. Clement-van Alkemade says that maps, in general are categorized as G3180-9980.[157] In addition, these maps have different features that cannot be accommodated by these standards. Moreover, they cannot reflect the context of each map collection. The maps of the *topografische dienst* were related to Dutch military services during the nineteenth and the twentieth centuries in the Netherlands, their surroundings, and their colonial states like the Netherlands East Indies.

Numerous studies explore map classification systems. To begin, Patricia A. Moore suggests that topographic maps should be arranged according to their series.[158] On the other hand, an American cartographer, Ralph E. Ehrenberg, suggests that the best method to classify maps within a collection according to the geographical area and with further subdivisions

[153] Mary Lynette Larsgaard, *Map Librarianship*: 117-118.
[154] Mary Lynette Larsgaard, *Map Librarianship*: 120-135.
[155] Christopher Edmond Merret, *Map Cataloguing and* Classification: 21.
[156] The Library of Congress, "Library of Congress Classification PDF Files," updated April 27, 2016, accessed March 3, 2017, https://www.loc.gov/aba/publications/FreeLCC/freelcc.html#About.
[157] Beacher Wiggins, "Preface," updated March 2016, accessed March 3, 2017, https://www.loc.gov/aba/publications/FreeLCC/G-preface.pdf.
[158] Patricia A. Moore, "Topographic Maps in US Libraries": 203.

according to subject and date.[159] It appears that the geographical area plays a crucial parameter in arranging topographic maps because topography and land-uses vary from one place to another. Afterward, M.H.G.Clement-van Alkemade, a former map curator of the *Vrije Universiteit* (Free University) in Amsterdam contends that the Dutch map curators utilized several methods to arrange maps before the first half of the twentieth century.[160] These are alphabetical and chronological order. She also contends that there are various elements in arranging maps, such as, date (s), geographical area, and themes of maps. This argument contrasts with that of Ralph E.Ehrenberg in which he contends that there is a hierarchy in arranging maps, including, area, subject, and date.[161]

The UBL employs the provenance as their method to catalog the maps originating from the *topografische dienst*. As previously mentioned, there are three collections of the *topografische dienst*'s maps in the special collections of the UBL: Johannes Tiberius Bodel Nijenhuis, the KIT and KITLV.[162] The UBL employs these collections to catalog the map collections of the *topografische dienst*, thus they utilize the method of provenance for cataloging the maps originating from the *topografische dienst*. This method is reminiscent to the study of Merret.[163] These provenances reflect their functions and tasks in accumulating maps of the *topografische dienst*. In other words, this cataloging method is ought to use the contexts of the three map collections to arrange and describe them. The collections of the Bodel Nijenhuis and the KITLV reflect the research purposes for which they were assembled, whereas the collection of the KIT depicts its previous function as a support organization for military services and colonial expansion. Matter of fact, the UBL does not have records about the acquisition process of these collections. Thus, the map librarians of the UBL or even their users sometimes have to analyze the context of these maps. Furthermore, the UBL does not produce or publish the inventories of these provenances, even though these provenances have been cataloged, as informed by Martijn Storms. Therefore, users will find difficulties to acquire the context of map holders or the context of maps itself. They also find intricacy to relate one map of the *topografische dienst* to other maps within the collection. At the same time, the acquisition and

159 Ralph E. Ehrenberg, *Archives and Manuscripts*: 20-21.
160 M.H.G. Clement-van Alkemade, "Kaartbeschrijven en Catalogiseren in Bibliotheken." In *Titelbeschrijving voor Kartografische Documenten*, eds. J. Smits and G. Staal, (The Netherlands: Doorn, 1983): 7-9.
161 Ralph E. Ehrenberg, *Archives and Manuscripts*: 20-21.
162 Martijn Storms, "Topografische Dienst."
163 Christopher Edmond Merret, *Map Cataloguing and Classification*: 10.

administrative history of these provenances might be scattered to users, thus a provenance research is required to provide users the context of each map collections of the *topografische dienst*.

Delineating the classification systems of the *topografische dienst*'s maps in the UBL is challenging because the UBL does not publish the inventories of the three aforementioned provenances. Classifying maps according to the map subject is appropriate for research purposes because there are wide-ranging topics for research using maps of the *topografische dienst*. Moreover, each provenance has different goal in collecting maps of the *topografische dienst*. According to the functions of the KIT, the maps originating from the *topografische dienst* are classified and organized based on geographical area and further chronological order because the KIT aimed at military services and colonial expansion of which emphasizing area was considered more important than the map subjects. Thus, geographical area is considered an important element to arrange maps of the *topografische dienst* as argued by Ralph E. Ehrenberg as well as Roman Drazniowsky. On the other hand, the collections of Bodel Nijenhuis and the KITLV are arranged based on the subject or types of maps because they aim at providing maps for research purposes. Nevertheless, these arguments are incorrect because the UBL employs geographical area and further chronological order for all map collections.[164] Thus, the UBL employ these elements for all of their map collections. Nevertheless, the UBL apply the geographical area as the tool to classify maps, thus they are unsuccessful to deliver the contexts of the Bodel Nijenhuis, the KITLV, and KIT.

The bibliographic arrangement of the *topografische dienst*'s maps in the UBL is more complicated than the archival arrangement in the National Archives of the Netherlands because there are two phases to arrange these maps: classification and cataloging. The librarians of the UBL consider the *topografische dienst* as colonial maps. The cataloging method of these maps is according to the provenance of these maps: Bodel Nijenhuis, the KIT and KITLV. The three provenances reflect their initial functions of collecting the *topografische dienst*'s maps. The collections of Bodel Nijenhuis and the KITLV aim at providing maps for the research purposes, whereas the KIT first aimed for military services and colonization. These different functions should be depicted in their inventories, thus users can be acquainted with the context of these

[164] Martijn Storms, "Topografische Dienst."

maps. Map classification systems reflect how the maps originating from the *topografische dienst* are arranged in the collections of Bodel Nijenhuis, the KIT and KITLV. It is challenging to delineate the classifications because the UBL does not provide the inventories of these collections. Thus, their functions are employed to analyze the classification systems. The collections of Bodel Nijenhuis and KITLV are arranged based on the map subjects, whereas the geographical area is a key element to organize the map collections of the KIT.

The UBL provides online catalogs for the students and staff of Leiden University to access the maps originating from the *topografische dienst* that are available in three different map collections. Arguably, users might encounter difficulties in finding their maps to consult. It is reminiscent of the argument of Marcy M. Bidney. She contends that searching an appropriate map within current online catalog is very tough.[165] Furthermore, the UBL employ the classification system based on the Dutch National Bibliographic Standard, *Gemeenschappelijk Geautomatiseerd Catalogussysteem* (GGC). It appears that users will use geographical areas to refine their search of maps. With regard to the map arrangement, the *topografische dienst*'s maps in the UBL are arranged based on area.[166] Therefore, the UBL should provide inventories of Bodel Nijenhuis, the KIT and KITLV because they have varied methods to catalog and classify maps originating from the *topografische dienst*. Furthermore, users might require the information about the history of the provenance as well as the acquisition history. Thus, the users can acquire the context and relatedness of the maps of the *topografische dienst* by using the inventories of three collections of the *topografische dienst*'s maps in the UBL.

[165] Marcy M. Bidney, "Can Geographic Coordinates in the Catalog Record be Useful?" *Journal of Map & Geography Libraries* 6 (2010): 143, accessed March 1, 2017, DOI: 10.1080/15420353.2010.492304.
[166] Lam Ngo, "Special Collections of the Leiden University's Library."

3.2 The Description of the *Topografische Dienst'*s Maps

Bibliographic description is an intellectual process of analyzing and organizing bibliographic materials to make them accessible as suggested by Randall C. Jimerson.[167] Description can be performed after a collection of maps is well arranged.[168] Each description is built from various elements.[169] As previously mentioned, a context plays important role in describing maps.[170] However, the UBL is considered miscarriage to deliver the contexts of the three map collections.

Librarians, in general, utilize the International Standard Bibliographic Description (ISBD) to describe bibliographic materials. It was established in 1973 by the International Federation of Library Associations and Institutions (IFLA).[171] It aims at providing consistency in delivering information for all published resources in libraries.[172] The UBL considers the maps of the *topografische dienst* as published resources. There are eight areas of ISBD, specifically, title and statement of responsibility, edition, material or type of resource specific, publication, physical description, series, note, and resource identifier and terms of availability.[173] Unlike the archival standards of description that focus on the provenance of archives, the bibliographic standards of description focus on the media and content of the materials. The ISBD consists of three elements: mandatory, conditional, and optional.[174] The optional elements are dependent on the policy of the bibliographic agencies. There are numerous types of ISBDs, for instance, the International Standard Bibliographic Description for Monographic Publications (ISBD-M), International Standard Bibliographic Description for Non-Book Materials (ISBD-NBM), International Standard Bibliographic Description for Serials (ISBD-S), International Standard Bibliographic Description for Electronic Resources (ISBD-ER), International Standard Bibliographic Description for Antiquarian (ISBD-A), International Standard Bibliographic

[167] Randall C. Jimerson, "Archival Descriptions and Finding Aids": 125.
[168] M.H.G. Clement-van Alkemade, "Kaartbeschrijven en Catalogiseren in Bibliotheken": 10-11.
[169] P. Ratsma, "Beschrijving." In *Handleiding voor het Beheer van een Topografisch-Historische Atlas*, eds. P.Ratsma and C.C.S. Wilmer, (Hilversum: Stichting Archiefpublikaties, 1988): 113.
[170] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps": 358.
[171] International Federation of Library Associations and Institutions, *International Standard Bibliographic Description* (Spain: IFLA/ K.G. Saur, 2007): x.
[172] International Federation of Library Associations and Institutions, *International Standard Bibliographic Description*: vii.
[173] International Federation of Library Associations and Institutions, *International Standard Bibliographic Description*: 11-12.
[174] International Federation of Library Associations and Institutions, *International Standard Bibliographic Description*: 2.

Description for Printed Music (ISBD-PM), and International Standard Bibliographic Description for Cartographic Materials (ISBD-CM).[175]

The IBSD-CM is a bibliographic tool for librarians to describe cartographic materials that encompass maps, plans, and globes.[176] However, this standard cannot be applied to describe atlases because librarians perceive atlases as books instead of cartographic materials. The ISBD-CM has eight elements: title and statement of responsibility, edition, mathematical, publication and distribution, physical description, series, note, and standard number.[177] Like the archival description, the ISBD-CM has multilevel description which is based on the division of information into two or more levels.[178] Arguably, the maps of the *topografische dienst* in the UBL can be described at multiple levels based on area or sheet numbers.

Marijke Kok contends that map identification is crucial for librarians before describing maps.[179] Various studies reveal the elements to describe maps. Mary Lynette Larsgaard, first, suggests sixteen descriptive elements of maps in the following sequence: geographical area or location, subject, title, scale, series designation, number and number of sheet, edition, authorship, place of publication or execution, publisher or printer, date, physical description, additional information (for example, insets, language, and map projection), sources and bibliographical information, lists of sheets, and library reference number.[180] Arguably, these elements are primarily aimed at geographers or cartographers. Furthermore, the information of the *topografische dienst*'s maps can fulfill the aforementioned elements. In the second place, Roman Drazniowsky contends that there are numerous elements of representing maps, for instance, area, year, subject, title of the map, sheet number, scale, projection, author or publisher, place of publication, and short description.[181] Thirdly, M.H.G. Clement-van Alkemede suggests that there are seven elements to describe maps: title, year of publication, the names of drawer, publisher,

[175] International Federation of Library Associations and Institutions, *International Standard Bibliographic Description*: x.
[176] International Federation of Library Associations and Institutions, *International Standard Bibliographic Description for Cartographic Materials*: 1.
177 International Federation of Library Associations and Institutions, *International Standard Bibliographic Description for Cartographic Materials*: 8-9.
[178] International Federation of Library Associations and Institutions, *International Standard Bibliographic Description for Cartographic Materials*: 50.
[179] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 36.
[180]Mary Lynette Larsgaard, *Map Librarianship*: 77-78.
[181] Roman Drazniowsky, *Cataloguing and Filing Rules for Maps and Atlases in the Society's Collection*: 2-10.

and engraver, description of the publication, and physical formats of maps.[182] There are various suggested elements for describing maps of the *topografische dienst*, as previously discussed in the chapter 1, such as title, scale, date (s), authors/ publishers, citation, sheet number, geographical references/ position, language, and short summary of maps. Nevertheless, the UBL do not utilize all the aforementioned description elements of maps to describe the maps of the *topografische dienst* and deliver these elements to users because that would be too complicated.

Martijn Storms informs that the collections of the *topografische dienst*'s maps in the UBL have different methods in describing maps because they have different functions. The collections of Bodel Nijenhuis and the KIT describe maps on the level of series, whereas the collection of KITLV describes maps on the level of item.[183] Even though, both collections Bodel Nijenhuis and the KIT have different functions in accumulating maps, they have same method in describing their maps. Bodel Nijenhuis, a private map collector who donated his collection to the UBL for the research purposes, thus he likely had limitation in describing maps on the item level, whereas efficiency might be the reason the KIT described their maps on the series item. On the other hand the KITLV provide description on the level item in order to get detail information from the *topografische dienst*'s maps.

There are various elements are employed by the UBL to depict the information of the *topografische dienst*'s maps in the online catalog. In the first place, Lam Ngo contends that to some extent, the title of maps do not represent the contents of maps.[184] Consider a map series as an example, it solely mention the same title for various sheet in a series. Figure 1 indicates the online catalog of the *topografische dienst*'s maps reflects the single level of description instead of multilevel description, as previously mentioned, because this collection can employ multilevel description as suggested by the ISBD-CM by employing sheet numbers of these maps. Therefore, the description can reflect the context of the *topografische dienst*'s maps. The map librarians do not utilize one element of the ISBD-CM, namely physical description. They do not inform users which maps are classified as too fragile to consult. This lacuna is crucial not only for users but also for the custodians of the UBL. Martijn Storms, however, contends that this

[182] M.H.G. Clement-van Alkemade, "Kaartbeschrijven en Catalogiseren in Bibliotheken": 7.
[183] Martijn Storms, "Topografische Dienst."
[184] Lam Ngo, "Special Collections of the Leiden University's Library."

lacuna becomes less important due to digital era.[185] But, they have to consider the existing analog maps in the UBL, thus they need this aforementioned metadata. Secondly, the online catalog of the UBL employs numerous description elements for the collection of the *topografische dienst*, such as title, short summary of maps, date (s), authors/ publishers, scale, sheet number, size, language, astronomical position, color, quantity, and keywords, as shown by figure 6.

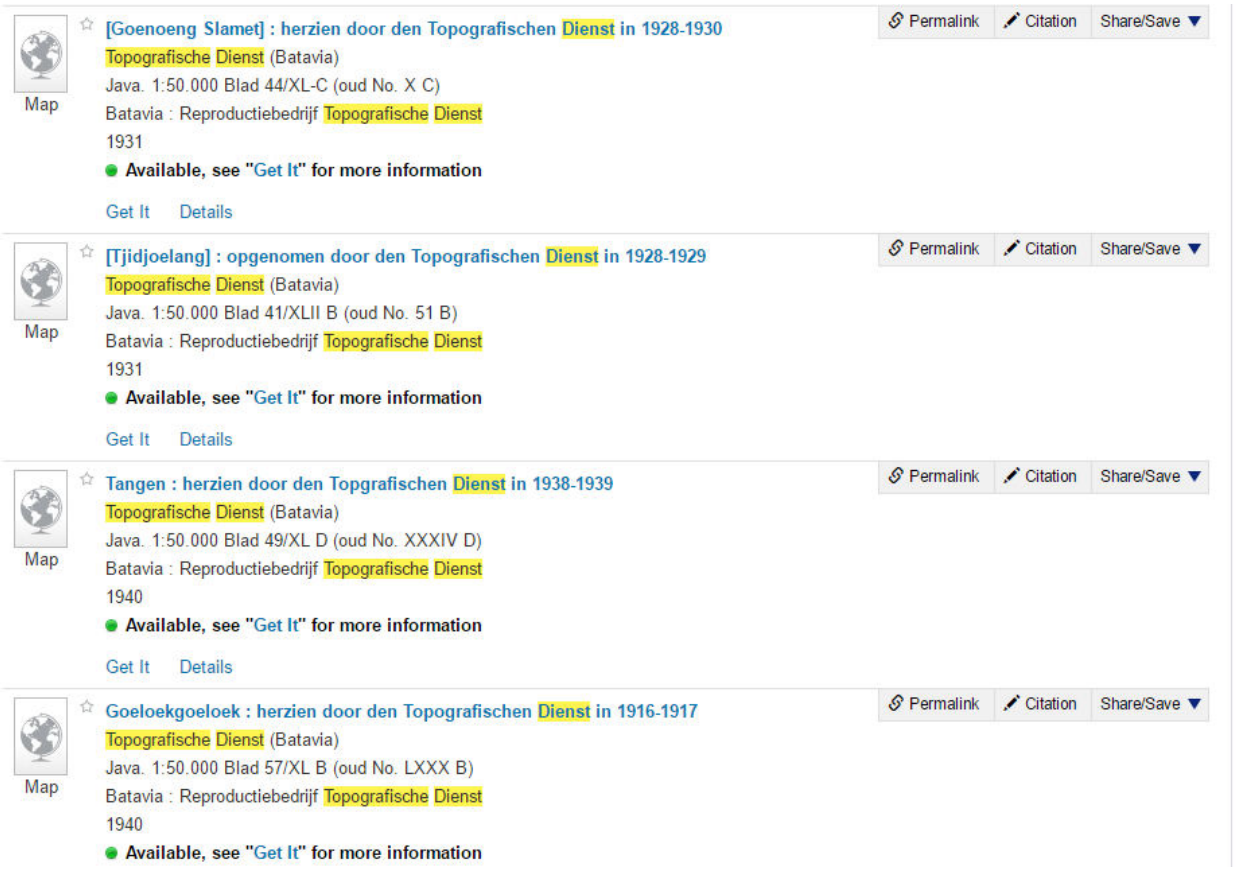


Figure 6. Description of Online Inventory of the *Topografische Dienst* in the UBL[186]

[185] Martijn Storms, "Topografische Dienst."
[186] Leiden Universiteit, "Topografische Dienst,"accessed March 15, 2017, http://catalogue.leidenuniv.nl/primo_library/libweb/action/search.do?ct=Next+Page&pag=nxt&indx=1211&pageNumberComingFrom=121&frbg=&rfnGrpCounter=1&fn=search&indx=1201&mulIncFctN=facet_rtype&dscnt=0&rfnIncGrp=1&scp.scps=scope%3A(UBL_DSPACE)%2Cscope%3A(%22UBL%22)%2Cscope%3A(UBL_DTL)%2Cscope%3A(UBL_ALMA)%2Cprimo_central_multiple_fe&tb=t&vid=UBL_V1&mode=Basic&ct=Next%20Page&tab=all_content&srt=rank&dum=true&vl(freeText0)=topografische%20dienst&dstmp=1489614170183&fctIncV=maps.

Generally speaking, the description of the *topografische dienst*'s maps in the UBL is done on the level of item or single level and series. The map description in the UBL is better than the description in the National Archives of the Netherlands on the level of item, even though there are various inconsistencies among their map collections. The elements to describe the maps of the *topografische dienst* are title, short summary of maps, date (s), authors/ publishers, scale, sheet number, size, language, astronomical position, color, quantity, and keywords. It appears that the map curators of the UBL employ almost all elements suggested by aforementioned scholars. Nevertheless, they do not use the citation/ cross-reference, and type of projection as elements in describing the maps originating from the *topografische dienst*. Describing the contexts and connectedness of maps are the most important things in interpreting maps.[187] Furthermore, the description in the UBL is unsuccessful to deliver the context of the maps because they emphasize their description to the content of these maps instead of its context.

By and large, the arrangement of the *topografische dienst*'s maps in the special collection of the Main Library of Leiden University (UBL) is more complicated than the arrangement in the National Archives of the Netherlands (NAN) because the librarians of the UBL employ two business processes to arrange the *topografische dienst*'s maps: cataloging and classification. There are various approaches to catalog these maps, for instance area, subject, scale, size, author, and provenance. The UBL employs the provenance to catalog the maps originating from the *topografische dienst* because the UBL has three provenances or collections that hold the maps of the *topografische dienst*: Johannes Tiberius Bodel Nijenhuis, the *Koninklijk Instituut voor de Tropen* (KIT), meaning the Royal Tropical Institute, and the *Koninklijk Instituut voor Taal-Land- en Volkenkunde* (KITLV). It reflects different context and arrangement. Nevertheless, the UBL appears that they fail to provide information about the context of each provenance that holds the maps of the *topografische dienst*.

The map classification is employed to organize these maps systematically and consistently. There are numerous standards to classify bibliographic materials, such as the Dewey decimal classification system, the Library of Congress subject headings, and Boggs-Lewis Classification. Additionally, there are numerous categories of maps classification, for

[187] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps": 358.

instance, area, subject, date, and theme. Determining how a collection of *topografische dienst*'s maps is organized is challenging because there are no inventories of the three aforementioned provenances in the online catalog of the UBL. Thus, according to the previous functions of the collectors, there are differences in organizing maps. All map collections in the UBL are arranged according to the geographical area and period, thus the context of the *topografische dienst*'s maps is difficult to ascertain. Thus, the UBL should provide the inventory of the collections of Bodel Nijenhuis, the KIT and KITLV. In addition, these inventories can provide information about the functions and the map arrangement of these collections. Nevertheless, the UBL employs geographical area and further chronological order for their map collections. Therefore, the librarians of the UBL consider that maps of the *topografische dienst* as published materials of which general arrangement of maps can be applied for their whole map collections. It distinguishes between librarians and archivists.

Map description is considered a representation tool that delivers information to the users. There are various scholars who study the elements of cataloging cartographic materials, maps in particular. These are M.H.G. Clement-van Alkemede and Roman Drazniowsky. Alkemede contends that title, year of publication, author, description of the publication and physical format of maps are elements to describe maps.[188] Drazniowsky further suggests that geographical references, date (s), subject, title, sheet number, scale, projection, place of publication, and short description are elements to describe maps.[189] Furthermore, I suggest that title, scale, date (s), authors/ publishers, citation, sheet number, language, and short summary of maps are the description elements for maps because these elements reflects both the content and context of the maps. With regard to the description of the *topografische dienst*'s maps, the map curators of the UBL utilize various elements to describe these maps, including title, short summary of maps, date (s), authors/ publishers, scale, sheet number, size, language, astronomical position, color, quantity, and keywords. Nevertheless, there are both commonalities and inconsistencies in describing maps of the *topografische dienst* from one collection to another. Furthermore, the UBL does not perform the multilevel description as suggested by the International Standard Bibliographic Description for Cartographic Materials (ISBD-CM) because the three sub-collections are given.

[188] M.H.G. Clement-van Alkemade, "Kaartbeschrijven en Catalogiseren in Bibliotheken": 10.
[189] Roman Drazniowsky, *Cataloguing and Filing Rules for Maps and Atlases in the Society's Collection*: 2-10.

CHAPTER IV.

THE *TOPOGRAFISCHE DIENST*'S MAPS IN THE NATIONAL ARCHIVES OF THE REPUBLIC OF INDONESIA

The National Archives of the Republic of Indonesia (ANRI) is the state archives of Indonesia. As an archival institution, it is obliged to keep and provide access of archives as national collective memories for users.[190] As a former colonial state, known as the Dutch East Indies, Indonesia has historical relations with the Netherlands. These relations are reflected in the colonial archives that are kept in the ANRI. There are numerous media of colonial archives in ANRI, such as, textual-archives, films, photographs, and maps. The *topografische dienst*, meaning the topographic service (the predecessor of the Indonesian Topographic Service) is one of the sources of maps in ANRI which are a part of the colonial archives.

The *topografische dienst* was a colonial mapping agency in the Netherlands East Indies. It was established in 1864.[191] It was coordinated with the *topografische dienst* in the Netherlands as their colonial ruler. It only mapped the Netherlands East Indies and its surroundings, unlike the *topografische dienst* in the Netherlands which mapped their region and their colonial states. With regard to the maps of the *topografische dienst* in the ANRI, there are 3.268 maps dating from 1899 until 1960.[192] There are various types of the *topografische dienst*'s maps in ANRI: overview, topographic, geologic, and city maps as the consequence of their varied functions and activities. To the best of my knowledge, however, there are no textual-archives in the provenance of the *topografische dienst*. Therefore, the context of the Indies *topografische dienst*'s maps is difficult to determine. The maps of the Indies *topografische dienst* reflect colonial archives. From the archival perspectives, the functions and activities of the *topografische dienst* in the East Indies also represented the process of creating, using and maintaining of the *topografische dienst*. Consequently, it affects the arrangement of the maps of the *topografische dienst*. This chapter considers the arrangement and description of the *topografische dienst*'s maps that are

[190] Terry Cook, "What Is Past Is Prologue": 18-20.
[191] Topographische Dienst, *75 Jaren Topografie in Nederlandsch-Indie*, (Nederlandsch-Indië: Topographische Dienst, 1949): 1.
[192] Arsip Nasional Republik Indonesia, *Kartografi Indonesia: 1913-1946*, (Jakarta: Arsip Nasional Republik Indonesia, 1989).

kept and managed by ANRI as well as the administrative history of the *topografische dienst* in the East Indies.

4.1 The Administrative History of the *Topografische Dienst* in the Dutch East Indies

Norman J.W. Thrower contends that the work of topographic mapping is almost exclusively done by governments.[193] The *topografische dienst* in the Netherlands East Indies was first under supervision of the *Departement van Oorlog*, meaning the Indies Department of War.[194] Thus it was primarily a military mapping agency. There were three incidents of reorganization of the *topografische dienst* during the nineteenth and twentieth centuries. These reorganizations reflected the expanding functions and activities of the *topografische dienst*. Unlike, the *topografische dienst* in the Netherlands, the *topografische dienst* in the East Indies had two official names: the *topographisch bureau en militaire verkenningen* (the topographic bureau and military explorations) and the *topografische dienst*. This sub-chapter aims at investigating the administrative history of the *topografische dienst* in the East Indies from the nineteenth until the twentieth century and the concomitant varied functions and activities of the *topografische dienst*.

The *topographisch bureau en militaire verkenningen* was established in 1864 under the *directie der genie en sappeurs* (the Divisions of Military Engineering), the sixth division of the *Departement van Oorlog*.[195] It was the first name of the Indies topographic service. The East Indies government was urged to establish a topographic mapping agency after their military campaign in Java (1825) and West Sumatra (1821-1837).[196] Under this consideration, they established the *topografische dienst* on February 25, 1864 according to the Indies government decree number 12.[197] The aim of establishing the *topographisch bureau en militaire verkenningen* was for military purposes as well as colonization because the Dutch colonizer had experienced the Java and *Padri* war in the nineteenth century. Without knowing the spatial information of these regions, they had found difficulties to arrange the strategy to win these wars. Thus, it caused high cost to fund these wars. Furthermore, the East Indies asked the

[193] Norman Joseph William Thrower, *Maps &* Civilization: 182.
[194] Topographische Dienst, *75 Jaren Topografie in Nederlandsch-Indië*: 33.
[195] Gouvernement van Nederlandsch Oost-Indies, *Regerings-almanak voor Nederlandsch-Indië 1865*, (Batavia: Landsdrukkerij, 1865): 342.
[196] Ferjan Ormeling, "Topografische Dienst," interviewed by Octavia, May 9, 2016.
[197] Topographische Dienst, *75 Jaren Topografie in Nederlandsch-Indië*: 1.

topographisch bureau en militaire verkenningen to map Atjeh because they had military expeditions during the period 1873-1904.[198] In this period, there were military explorations in the archipelago, for instance, in Bandjarmasin (1859-1862), Makassar en Ambon (1868), and Bali (1868).[199] Afterward, the East Indies government decided to transform the *topographisch bureau en militaire verkenningen* into the *topografische dienst*.

The *topografische dienst* was established by the East Indies government in 1874 according to Dutch Indies government decree number 2 dated on April 1874.[200] It was under the *Directie der Generalen Staf*, the seventh division of the *Departement van Oorlog*.[201] Afterwards, the *topografische dienst* received a higher position in the organizational structure of the *Department van Oorlog*. It became the ninth division of the *Departement van Oorlog* in 1907.[202] The aims of the *topografische dienst* were political and economical. Delineating the border line between the Dutch and British Borneo as well as internal borderlines in the late nineteenth and early twentieth centuries indicated the political purposes of mapping of the *topografische dienst* in the East Indies.[203] The *topografische dienst* was also assigned by the Indies Government to provide spatial information about landownership by creating cadastral maps.[204] A cadastral map is defined as a map that contains information about land parcels, well measured boundaries, and legal land rights.[205] Norman J.W. Thrower argues that cadastral maps were utilized for the economic and political purposes.[206]

After independence, the *topografische dienst* began its post-colonial life. It was reorganized by the Indonesian government in 1945 into the *Jawatan Topografi Angkatan Darat*

[198] NationaalArchief, Den Haag, Ministerie van Koloniën, nummertoegang 2.10.02, inventarisnummer 6651b.
[199] P.A. van der Lith, *Encyclopædie van Nederlandsch-Indië*: *VierdeDeel (Soemb-Z)*, ('s-Gravenhage: Martinus Nijhoff, 1921): 408.
[200] Topographische Dienst, *75 Jaren Topografie in Nederlandsch-Indië*: 2.
[201] Gouvernement van Nederlandsch Oost-Indies, *Regerings-almanak voor Nederlandsch-Indië 1875*, (Batavia: Landsdrukkerij, 1875): 569-632.
[202] Topografische Dienst, *De Topografische Dienst in Nederlandsch-Indië 1874-1924*: 20-21.
[203] Topografische Dienst, *De Werkzaamheden van den Topografischen Dienst in de Westerafdeeling van Borneo (1886-1895)*, (Bandoeng: NN.V. Boekh. Visser& Co., 1920): 1-10.
[204] Topografische Dienst, *De Topografische Dienst in Nederlandsch-Indië 1874-1924*, (Weltevreden: Topografische Dienst, 1924): 41-43.
[205] Ian Williamson and Stig Enemark, "Understanding Cadastral Maps." *The Australian Surveyor* Vol. 41 (1996): 38-52, accessed April 11, 2016, https://minerva-access.unimelb.edu.au/bitstream/handle/11343/34005/66364_Understanding%20Cadastral%20Maps.pdf?sequence=1.
[206] Norman J.W. Thrower, *Maps and Civilization*: 92.

(*Jantopad*), meaning the Indonesian Topographic Service. The *Jantopad* is topographic mapping agency under the Indonesian army. It was established on September 28, 1945. Afterwards, the *Jantopad* was transformed into the *Direktorat Topografi Angkatan Darat* (*Dittopad*) by the Indonesian Armed Forces in 1985. It aims at providing topographic maps for the military purposes. [207] For this reason, this reorganization resulted on the rearrangement of the *topografische dienst*'s maps because they only have one goal of mapping to provide maps for the Indonesian military services. It also reflects how post-colonialism took over colonial maps.

As a government institution, the *topografische dienst* had produced archives as the consequences of their activities. These archives reflect its context of mapping. Figure 7 indicates that maps were their main products due to their works. However, from archival perspectives, not all maps are categorized as archives because they were subjected to appraisal and selection. These maps were transferred to the ANRI in 1949 by the Indonesian topographic service, known as the *Dittopad*. The map archives of the *topografische dienst* of the East Indies are currently kept and managed by the Indonesian state archives. In 1989, the ANRI has created an inventory of the maps of the Indies *topografische dienst*. The finding aid of the *topografische dienst*'s maps was produced by the division of arrangement and description of maps and architectural drawings.[208] It was done by the archivists of ANRI in 1989. [209]

[207] Koeswidyanti et al., *Sejarah Topografi Angkatan Darat: Tahun 1945-2011*, (Jakarta: Direktorat Topografi Angkatan Darat, 2011): 30-33.
[208] Bakat Untoro, "Topografische Dienst's maps in the ANRI," interviewed by Octavia, April, 10, 2017.
[209] Arsip Nasional Republik Indonesia, *Kartografi Indonesia*: 1.

Figure 7. The Storage of the *topografsche dienst*'s maps in Indonesia[210]

4.2 The Arrangement of the *Topografische Dienst*'s Maps

There are 3.268 maps of the Indies *topografische dienst* in the ANRI, as previously mentioned. There are various types of the Indies *topografische dienst*'s maps, for instance, *topografischekaarten* (topographic maps), *verkenningskaarten* (reconnaissance maps), *garnizoenskaarten* (garrison maps), *schetskaarten* (outline maps), *overzichtskaarten* (geological maps), *geologischekaarten* (geological maps), and *bladwijzerkaarten*. These types reflect the varied functions of the *topografische dienst* as a colonial topographic mapping in the East Indies. As previously mentioned, there are various arguments about the importance of the context in arranging maps. These are Sir Hillary Jenkinson[211], and Sue Mc. Kemish[212]. The context is

[210] Nationaal Archief, Den Haag, Fotocollectie Dienst voor Legercontacten Indonesië, nummer toegang 2.24.04.03, inventarisnummer 10031, accessed February 26, 2017, http://proxy.handle.net/10648/05f24c33-a3bb-0e64-4c43-10bd7c86e15e.
[211] Sue McKemmish, "Introducing Archives and Archival Programs": 10.

important not only for archivists to arrange and describe maps but also for users to analyze their source. As previously mentioned, the maps originating from the Indies *topografische dienst* were transferred to the ANRI in 1949. Afterward, the ANRI created the inventory of the *topografische dienst*'s maps in 1989.[213]

The *Dittopad* was established in 1945.[214] It is a successor of the *topografische dienst*. The *Dittopad* organized their archives based on the geographical area because they solely have one function of mapping. From the archival perspectives, the provenance of the *topografische dienst*'s maps is different with the maps of the *Dittopad* because both institutions have different functions and context in mapping.

The Indonesian state archives holds and manages the maps of the *topografische dienst* dating from 1899 until 1960. However, the ANRI does not use the *topografische dienst* as the title of the inventory of maps originating from the Indies *topografische dienst*, as shown by figure 8.

[212] Sue McKemmish, "Introducing Archives and Archival Programs": 10.
[213] Arsip Nasional Republik Indonesia, *Kartografi Indonesia*: 1.
[214] Koeswidyanti et al., *Sejarah Topografi Angkatan Darat*: 17.

Figure 8. The Inventory of the *topografische dienst*'s maps in the ANRI
Courtesy of Suharti, March 21, 2017

Figure 8 indicates that the maps originating from the *topografische dienst* in the Dutch East Indies date from 1913 until 1946. However, these maps actually date from the late nineteenth until the twentieth century. Furthermore, the ANRI does not hold and managed the written-archives of the Indies *topografische dienst*, thus the context of mapping might difficult to ascertain.

There are numerous studies about archival arrangement, maps in particular. Ralph E. Ehrenberg contends that there are two categories of maps according to the archival perspectives: maps as attached documents of archives or manuscripts, and maps as the main documents of its creator agency.[215] With regard to the maps of the Indies *topografische dienst*, these maps are considered as main documents because it was the duty of the *topografische dienst* to create and publish maps. Oliver W. Holmes further argues that the maps which are created and accumulated

[215] Ralph E. Ehrenberg, *Archives and Manuscripts*: 19.

by the mapping agency as the creator agency reflect natural series that should be maintained as the original order by archival institutions.[216] With reference to the map archives of the *topografische dienst*, the *Dittopad* accumulated and organized these maps as the successor of the *topografische dienst* in the East Indies. Consequently, they might rearrange these maps according to their functions of mapping. As previously mentioned, the *Dittopad* aims at providing maps for military purposes, thus, they might arrange maps based on geographical area. It is analogous to the arguments of Marijke Kok and Ralph E. Ehrenberg who contend that geographical area is the key element to arrange maps.[217] Consequently, it indicates the original arrangement from the *Dittopad* before these maps were transferred to the ANRI. Nevertheless, as previously argued in chapter I, the mapping agency that has one primarily function or subject can arrange maps based on geographical area and yet this does not apply to the arrangement of the *topografische dienst*'s maps that were transferred to the ANRI in 1989.

Arranging maps cannot be separated with the archival principles of provenance and original order. Luciana Duranti contends that the principle of provenance reflects the authority and functions of the creator agency.[218] With reference to the *topografische dienst* and its successor, the *Dittopad*, the two mapping agencies are considered as different provenances because they have different functions and authorities in mapping. Therefore, they have different methods in organizing their maps. Moreover, the maps of both provenances should be separated to preserve the context of these maps. However, there are a few maps from the *Dittopad* that should be separated because the provenance is different. Thus in the event, the principle of provenance and the context of these maps is not well preserved.

Arrangement is also performed with respect to the principle of original order. This principle is much studied and directly concerns archival scholars. In the first place, Richard Pearce-Moses contends that this principle ensures that the arrangement depicts the initial archival organizations set by its creator agency. However, he also argues that archivists are allowed to re-arrange the given original arrangement in order to preserve the context of archives.[219] Afterward, Ralph E. Ehrenberg suggests that archivists can re-arrange archives to make them findable. He

[216] Oliver W. Holmes, "Archival Arrangement: Five Different Operations at Five Different Levels." *The American Archivist* 2 (1964): 21-41.
[217] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 46-47.
Ralph E. Ehrenberg, *Archives and Manuscripts*: 20-21.
[218] Luciana Duranti, *Diplomatics: New Uses for an Old Science*, (Chicago: Scarecrow Press, 1998): 177.
[219] Richard Pearce-Moses, *A Glossary of Archival and Records Terminology*: 35.

also argues that the re-arrangement is appropriate for maps, aerial photographs, and technical drawings.[220] Nevertheless, this method does not adhere to the principles of provenance and original order. Additionally, the context of the *topografische dienst*'s maps might be lost or rendered indistinguishable.

The organization of the maps of the *topografische dienst* of the Dutch East Indies in ANRI is based on the geographical area. The arrangement of the *topografische dienst* in the ANRI is different with the arrangement in the National Archives of the Netherlands (NAN). There are hierarchies of maps arrangement of the *topografische dienst*, including *fonds*, series and subseries. There are 28 series and 158 subseries as the arrangement of the *topografische dienst*. The geography of the East Indies according to islands is employed to determine the series of the *topografische dienst*'s maps. This series consists of[221]:

1) Nederlands Indië;
2) Java *en* Madoera;
3) Sumatra;
4) Borneo;
5) Celebes;
6) *Klein* Soenda *Eilanden*;
7) Bali;
8) Lombok;
9) Soembawa;
10) Soemba;
11) Flores;
12) Alor;
13) Timor;
14) Wetar;
15) *Zuid Wester* en *Zuid Ooster Eilanden*;
16) Molukken *en Nieuwe* Guinea;
17) Ambon *Groep*;
18) Ceram;

[220] Ralph E. Ehrenberg, *Archives and Manuscripts*: 20.
[221] Arsip Nasional Republik Indonesia, *Kartografi Indonesia*: 2-5.

19) Boeroe *en* Soela;
20) Halmahera;
21) Ternate *en* Hiri;
22) Tidore *en* Maitara;
23) Morotai;
24) Kei *of* Ewab *Eilanden*;
25) Aroe *Eilanden*;
26) *Nieuw* Guinea;
27) *Eilanden* Rondom; and
28) *Eilanden* Rondom *Nieuw* Guinea;

These series do not reflect the functions and activities of the *topografische dienst* of the East Indies. Thus, the context of these maps is unsuccessful to maintain and deliver to users. Even though the arrangement is according to the geographical area, there are inconsistencies and redundancies in this arrangement, for instance the 16th and 26th series, and the 27th and 28th series. Furthermore, it also does not depict the administrative regions of the Netherlands East Indies. Hence, the context of these maps is difficult to discern. The sub-series of the maps of the *topografische dienst* consist of 158 sub-series. These sub-series mostly reflect map subjects as previously mentioned: *topografischekaarten* (topographic maps), *overzichtskaarten* (overview maps), *garnizoenskaarten* (garrison maps), *bladwijzerkaarten* (index maps), *plaatsen en omstreken* (cadaster maps), *schetskaarten* en *overzichtskaarten* (sketch and overview maps), and *verkenningskaarten* (surveillance maps). The maps subjects represent various military, political and economical functions of the *topografische dienst* in the East Indies. *Verkenningskaarten*, and *garnizoenskaarten* reflect the military function of the *topografische dienst*. On the other hand, the *overzichtskaarten* and *bladwijzerkaarten* reflect the political purposes of the *topografische dienst* in the Indies. Whereas, the economic purposes of mapping can be depicted by the sub-series of *plaatsen* en *omstreken*. Geographical area according to the administrative areas is also another parameter to delineate sub-series of the maps originating from the *topografische dienst*. It goes without saying that the ANRI consider the geographical area (islands of the Netherlands East Indies) as the series of the *topografische dienst*'s maps.

Furthermore, the maps subjects and administrative regions are the parameters for determining the sub-series of the *topografische dienst*'s maps.

In the long run, the maps of the Indies *topografische dienst* were collected and managed by the *Dittopad* before being transferred to the ANRI. The *Dittopad* was the post-colonial mapping agency that re-arranged the maps originating from the *topografische dienst* as the colonial mapping agency. From the archival point of view, thus, the *topografische dienst* and the *Dittopad* are different provenances that should be separated. However, the *Dittopad* did not adhere to this principle is not performed by the *Dittopad* because there are various maps from the *Dittopad* can be found in the provenance of the *topografische dienst*. The *Dittopad* arranged the maps of the *topografische dienst* based on the islands of the Dutch East Indies as the series of these maps because the *Dittopad* solely aimed at providing maps for the Indonesian army purposes. They arranged these maps based on geographical area and transferred these maps to the ANRI. Nevertheless, the re-arrangement performed by the *Dittopad* does not reflect the functions of the *topografische dienst*, thus the context of these maps is difficult to ascertain. ANRI holds and manages 3.268 maps originating from the *topografische dienst* dating from 1899 until 1960. There are hierarchies in arranging these maps, including *fonds*, series, sub-series, and items. Geographical area is used to determine the series and sub-series of these maps whereas the map subjects are employed to determine the sub-series of these maps. This hierarchy is unsystematic because they use sub-series between the levels of series and item, it is supposed to be files. The arrangement should be *fonds*, series, files, and items. Furthermore, this arrangement should be revised to preserve the context of these maps and reflect the functions of the *topografische dienst* in the East Indies. The archivists of ANRI is ought to use map subjects to determine the series levels. Geographical area of the *topografische dienst*'s maps can be utilized to determine the files levels.

4.3 The Description of the *Topografische Dienst*'s Maps

The International Council on Archives (ICA), as previously mentioned, does not provide specific archival standard for maps. They only have the General-International Standard Archival Description (ISAD-G) as tool to describe archives for all media of archives. It has various

hierarchies of describing archives: *fonds*, series, files, items (see figure 9). However, these hierarchy levels of description are varied according to its arrangement. With reference to the descriptive elements, the ISAD-G has mandatory elements consist of reference code, title, creator, date, extent of the unit of description, and level of the description.[222] In order to provide more information about maps, archivists can use the element of extent of the unit of the description by adding information about sheet number, scale, geographical references, citation, language, and a brief summary of maps. As previously argued by Thomas Barkowsky and Christian Freska, a map description has to reflect the connectedness or the context,[223] thus understanding the context of the *topografische dienst*'s maps is important for the archivists of the ANRI to provide a user-friendly finding aid without losing its context.

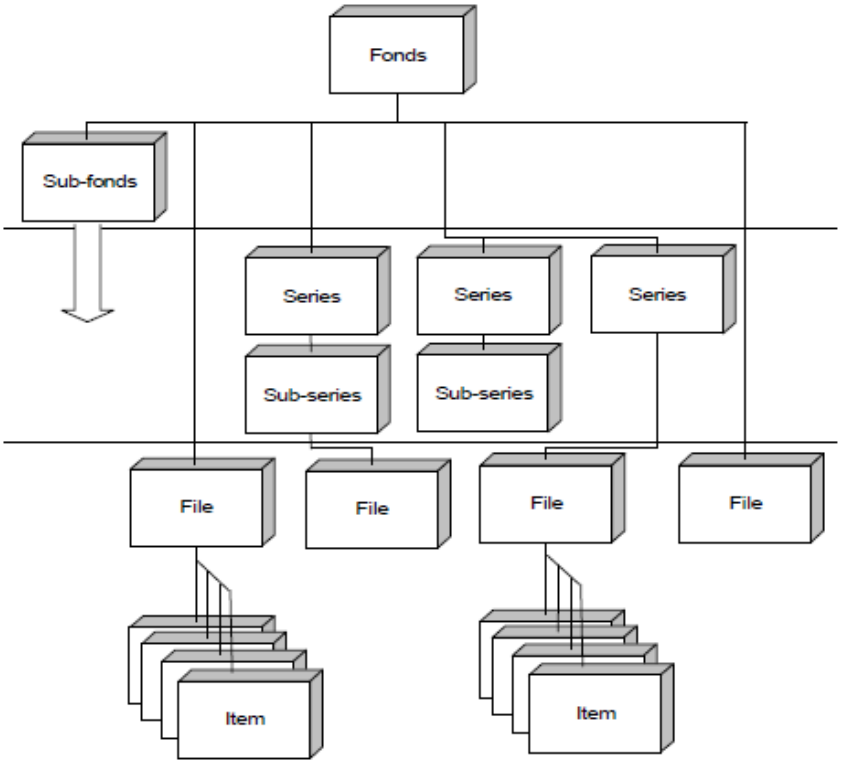


Figure 9. The hierarchy model of description[224]

[222] International Council of Archives, *General-International Standard Archival Description*: 9-18.
[223] Thomas Barkowsky and Christian Freksa, "Cognitive Requirements on Making and Interpreting Maps": 358.
[224] International Council of Archives, *General-International Standard Archival Description*: 36.

There are two scholars, as far as I am concerned, who work on archival description for cartographic materials, maps in particular, like Ralph E. Ehrenberg and Marijke Kok. In the first place, Ralph E. Ehrenberg contends that map description can be performed after the maps are well arranged. He also contends that maps and architectural drawings can be described at various levels. He suggests that there are hierarchies in describing maps, including series and items descriptions.[225] His argument is analogous with the rules of ISAD-G to describe maps from general to specific level.[226] He suggests that series description renders brief information of collective description at series level. There are four elements to describe maps on the level of series, including, title, and dates, number of sheets / quantity, as well as, descriptive statements.[227]

1) Series title

   Ehrenberg contends that series titles help users to differentiate one series from another. It also helps them to recognize the different functions of a mapping agency.

2) Date(s)

   This element depicts the dates of the earliest and latest maps in a series.

3) Number of sheets

   It reflects the quantity of maps in a series. Ehrenberg suggests that number of sheets can be another aid to distinguish series of maps.

4) Descriptive Statements

   These depict the general summary of the series of maps.

Ehrenberg argues that map description on the item level constitutes the most detailed information about maps. There are numerous elements to describe maps on the item level, including, file notation, title, author, date, scale, form/ medium, color, size and number of sheets, descriptive statement, notes, and indexes.[228]

1) File notation

   File notation reflects the unique number and indicates the location of a certain map.

[225] Ralph E. Ehrenberg, *Archives and Manuscripts:* 23-42.
[226] International Council of Archives, *General-International Standard Archival Description*: 16.
[227] Ralph E. Ehrenberg, *Archives and Manuscripts*: 23-27.
[228] Ralph E. Ehrenberg, *Archives and Manuscripts*: 27-42.

2) Title

Ehrenberg contends that the title provides information about map subject. Nevertheless, Gijs Boink, a map archivist of the NAN argues that in some cases a title does not represent the content of its map.[229]

3) Author

It indicates who is responsible in creating, or producing, and publishing maps.

4) Date

Ehrenberg contends that the archivists should utilize the latest date of maps as the element to describe the date of maps.[230] However, from the archival perspectives, archivists should consider date of surveys, compilation, annotation, approval, certification, proposal, and other dates that reflect the processes of making a map.

5) Scale

Scale is a distinctive element of maps, thus archivists have to use this element to describe maps on the item level.

6) Form/ medium

This element reflects the medium of maps and it is beneficial for preservation purposes.

7) Color

Analogous with the aforementioned element, color aims at preservation purposes. Black and white maps require less preservation treatments than the colorful maps.

8) Size and number of sheets

Size of maps represents the length and width of maps. It aims at preserving maps and informing users about the actual size of maps that they are going to use. It appears that physical measurement of maps is for analog maps instead of digital format. A number of sheets reflect the quantity of maps of each inventory number.

9) Descriptive statement

Ehrenberg contends that descriptive statement facilitates archivist to improve upon the title of maps by adding detail information about content of maps.[231]

[229] Gijs Boink, "Topografische Dienst."
[230] Ralph E. Ehrenberg, *Archives and Manuscripts*: 35.
[231] Ralph E. Ehrenberg, *Archives and Manuscripts*: 38.

Interestingly, Ehrenberg does not consider geographical references as an element to describe maps. This element is considered important because it is a distinctive and remarkable element of map. Marijke Kok, secondly, as previously mentioned in chapter 2, suggests that there are five elements to describe maps. These are *redactie* (type of maps), *inhoud* (a brief summary of the maps), *datum* (dates of maps), *ontwikkelingsstadium* (development level of maps), and *uiterlijke vorm* (outer forms of maps). In this article, however, she does not discuss the hierarchical levels of map descriptions.

The Indonesian state archives, ANRI, established a guideline of archival management for maps and architectural drawings in 2012. This guideline suggests that archival management for maps and architectural drawings encompasses acquisition, arrangement and description, preservation, and access. Figure 10 indicates a description form for maps and architectural drawings that consists of nineteen elements and the name of archivists who describe maps, including:[232]

1) *Fonds*

   A *fonds* depicts the creator agency of maps.

2) Series

   The ANRI defines series as a filing system of maps. Mostly, subjects of maps are considered to determine the series of maps. However, determining series is based on the functions and activities of the mapping agency as a creator agency without neglecting the principle of original order.

3) Files

   Files are mostly considered as a part of series. However, these three aforementioned hierarchies: *fonds*, series, and files cannot be employed to all creator agencies because each mapping agency has different hierarchies of description.

4) Inventory number

   An inventory number is a number of a map in a finding aid which is determined by archivists after arranging maps.

5) Unique code

[232] Arsip Nasional Republik Indonesia, *Peraturan Kepala Arsip Nasional Republik Indonesia Nomor 16 Tahun 2012*: 5-14.

A unique code is a combination code between inventory number and sheet number of maps. A sheet number helps users to understand the context of maps by analyzing the given codes on maps.

6) Title
7) A brief summary of map

   Archivists are expected to give a brief summary about the content of maps in order to give a better access to users.

8) Date

   This element depicts the published date of maps.

9) Quantity/ medium

   It indicates the sheet quantity and medium of maps because it helps how maps are properly stored.

10) Size

    This element reflects the length and width of a map. It aims at preserving maps.

11) Color

    This element indicates the color format of maps. There are two options, namely colored and black & white maps.

12) Method of map production

    It depicts how a map is created, whether it is printed, engraved or hand-drawn.

13) Medium of map printing

    This element reflects what kind of tools to make maps, whether it is pencil (for sketch maps) or ink.

14) Development of map

    This element provides the status of maps, such as original or copy.

15) Publisher

    This field indicates who published the maps. It also reflects who is responsible for contents of the maps.

16) Scale

    A scale indicates the ratio between the distance on maps and in real life (on the ground).

17) Type of maps

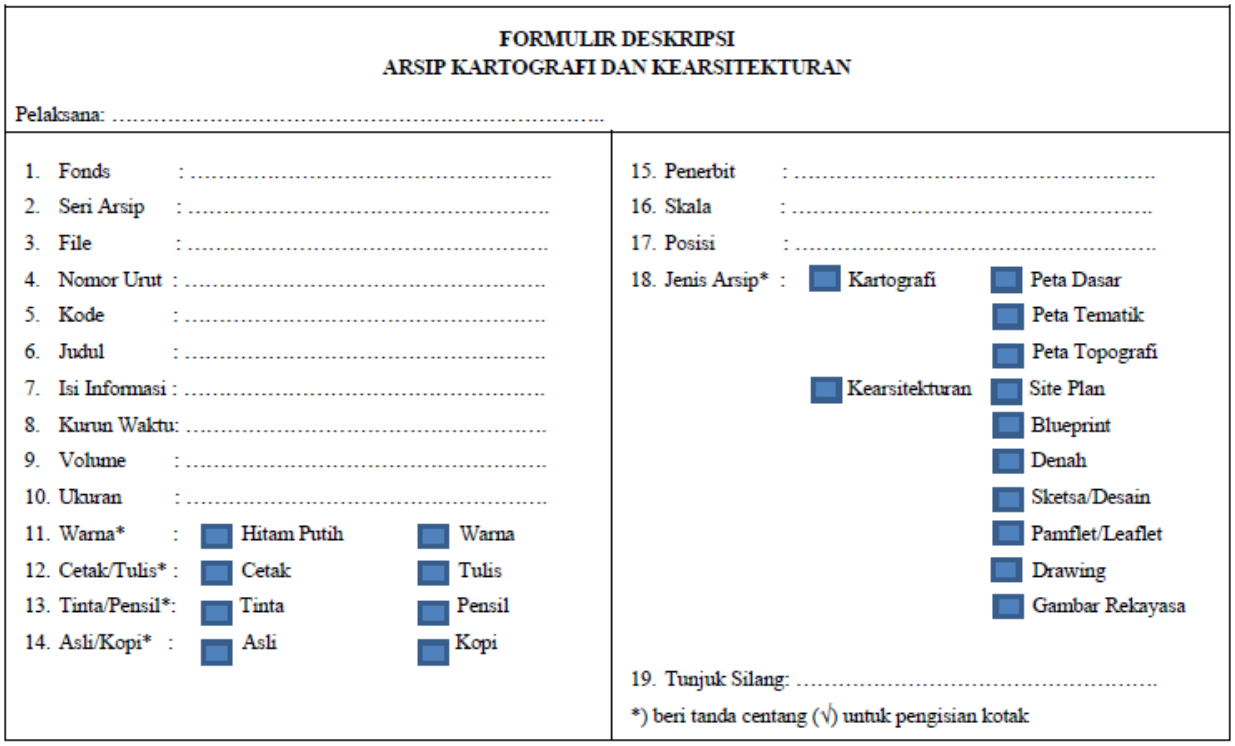
This element reflects what kind of maps. These are geo-reference, topographic, and thematic maps.

18) Position

It informs the geographical references of maps. There are geographical and astronomical maps/ coordinates.

19) Cross-reference

Cross-reference of maps indicate the relationships between maps and other medium of archives, mostly textual-documents to preserve the context of maps. This information can also indicate the interrelationships among maps.



FORMULIR DESKRIPSI
ARSIP KARTOGRAFI DAN KEARSITEKTURAN

Pelaksana: .....

1. Fonds : .....
2. Seri Arsip : .....
3. File : .....
4. Nomor Urut : .....
5. Kode : .....
6. Judul : .....
7. Isi Informasi : .....
8. Kurun Waktu: .....
9. Volume : .....
10. Ukuran : .....
11. Warna* : ☐ Hitam Putih ☐ Warna
12. Cetak/Tulis* : ☐ Cetak ☐ Tulis
13. Tinta/Pensil*: ☐ Tinta ☐ Pensil
14. Asli/Kopi* : ☐ Asli ☐ Kopi
15. Penerbit : .....
16. Skala : .....
17. Posisi : .....
18. Jenis Arsip* : ☐ Kartografi — ☐ Peta Dasar, ☐ Peta Tematik, ☐ Peta Topografi; ☐ Kearsitekturan — ☐ Site Plan, ☐ Blueprint, ☐ Denah, ☐ Sketsa/Desain, ☐ Pamflet/Leaflet, ☐ Drawing, ☐ Gambar Rekayasa
19. Tunjuk Silang: .....

*) beri tanda centang (√) untuk pengisian kotak

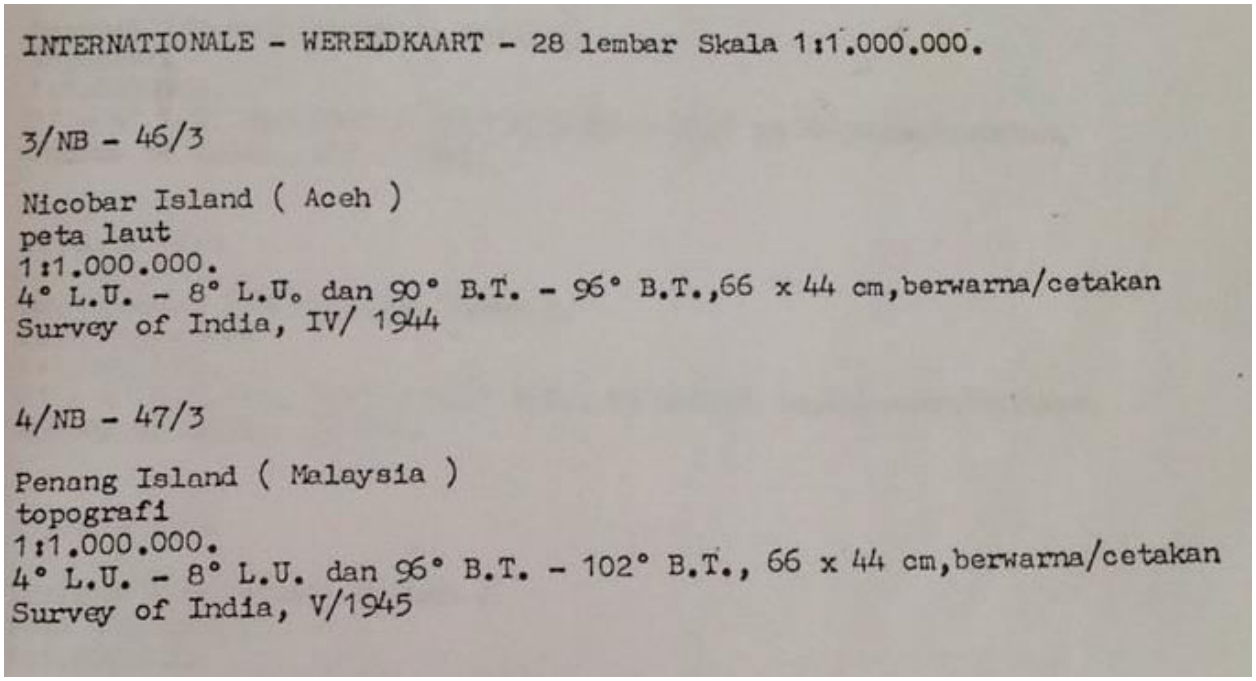
Figure 10. A Description Form for Maps and Architectural Drawings[233]

It appears that these aforementioned description elements emphasize the item description. However, the description on the level of *fonds* is depicted in the introduction of an inventory. Additionally, this guideline does not consider language as the element to describe maps as

[233] Arsip Nasional Republik Indonesia, *Peraturan Kepala Arsip Nasional Republik Indonesia Nomor 16 Tahun 2012*: 16.

suggested the ISAD-G.[234] The ANRI can describe the language of maps in the introduction of an inventory.

The finding aid of the *topografische dienst*'s maps of the East Indies was published in 1989.[235] Thus, the archivists of ANRI did not utilize their description elements nor the ISAD-G because it had not yet been published. They used narrative format to describe maps. As previously mentioned, there are hierarchies in this finding aid, including *fonds*, series, subseries and items. These hierarchies are analogous with Ralph E. Ehrenberg's argument about hierarchies in map describing on the level of series and item. These hierarchies are also concomitant with the ISAD-G. Description on the level of *fonds* is described in the introduction of this finding aid. In the introduction of this finding aid, the archivists of ANRI describe the acquisition history of the *topografische dienst*'s maps, its quantity, its arrangement, and brief summary about the content of these maps. They did not describe maps on the level of series. However, they describe maps on the level of sub-series. Figure 11 reflects the description level on the level of sub-series and items.


INTERNATIONALE - WERELDKAART - 28 lembar Skala 1:1.000.000.

3/NB - 46/3

Nicobar Island (Aceh)
peta laut
1:1.000.000.
4° L.U. - 8° L.U. dan 90° B.T. - 96° B.T.,66 x 44 cm,berwarna/cetakan
Survey of India, IV/ 1944

4/NB - 47/3

Penang Island (Malaysia)
topografi
1:1.000.000.
4° L.U. - 8° L.U. dan 96° B.T. - 102° B.T., 66 x 44 cm,berwarna/cetakan
Survey of India, V/1945

Figure 11. Description of the *topografische dienst*'s maps in the ANRI
Courtesy of Nugrahita Rizky, March 27, 2017

[234] International Council of Archives, *General-International Standard Archival Description*: 28.
[235] Arsip Nasional Republik Indonesia, *Kartografi Indonesia*: 1.

There are three descriptive elements for the maps originating from the *topografishe dienst* in the East Indies, for instance, title, quantity of maps, and scale. Meanwhile, there are nine descriptive elements on the level of item as can be seen in figure 11. These are title, type of maps, scale, geographical references, size, color, method of printing, publisher, edition, and date. These aforementioned elements are combination elements from Ehrenberg, the ISAD-G, and ANRI, such as file annotation/ code, title, author, date, scale, color, type of maps, and geographical references. Furthermore, as previously suggested in the first chapter, there are nine suggested elements of map descriptions, namely sheet numbers, language, size of charts, title, scale, date (s), authors/ publishers, and citation. Citation and language are not included in the description of the maps originating from the *topografische dienst* in the Netherlands East Indies. Nevertheless, there is no cross-reference to describe maps. Thus, users might find difficulties to identify relationships between maps and written-archives or other maps.

By and large, there are hierarchies in the description of the *topografische dienst*'s maps, including *fonds*, sub-series, and items. These hierarchies are unsystematic. They are analogous with Ralph E. Ehrenberg's arguments, and the archival description standard, namely the ISAD-G. Even though the ANRI does not hold and manage the written-archives of the *topografische dienst*, the archivists of ANRI provided information about the administrative history of the *topografische dienst* in the East Indies and acquisition history to preserve the context of these maps. The description elements to describe the maps originating from the *topografische dienst* are title, quantity of maps, scale, type of maps, geographical references, size, color, methods of map printing, publisher, edition, and date.

The *topografische dienst* in the East Indies was the first and foremost military mapping agency. It was established in 1864.[236] It had a relation with the *topografische dienst* in the Netherlands which supervised its activities. It had been reorganized in the organizational structure of the *Departement van Oorlog*. These reorganizations are the indication of the shifting and varied functions of the *topografische dienst*. The resulting activities reflect these changes in their activities. After Indonesian independence, the *topografische dienst* was reorganized into the

[236] TopographischeDienst, *75 Jaren Topografie in Nederlandsch-Indie*: 1-33.

Dittopad in September 1945. However, the *topografische dienst* and the *Dittopad* are not considered to the same provenance because the *Dittopad* had a single task to provide maps for the Indonesian military services. They arranged maps and afterward they transferred the maps of the *topografische dienst* in the East Indies to the Indonesian states archives.

There are 3.268 maps of the *topografische dienst* in the National Archives of Indonesia (ANRI). They were first transferred to the ANRI in 1949. These maps dated from 1899 until 1960. Afterwards, the ANRI came to hold and manage these maps. As a national archival institution, the ANRI is obliged to arrange and describe these maps in order to produce its finding aid according to the archival principles: provenance and original order. Based on the analysis, the principle of provenance of these maps is not applied because there are a few maps are published during the regime of the *Dittopad*. Thus, these maps should be separated from the provenance of the *topografische dienst*. On the other hand, the ANRI preserves the original order of the *topografische dienst*'s maps because the arrangement of these maps reflects the single task of the *Dittopad*. Nevertheless, the principle of original order is applied because the ANRI utilized the original arrangement from the *Dittopad*.

The arrangement of the *topografishe* dienst's maps in the ANRI is divided into a *fonds*, 28 series, 158 sub-series, and 3.628 items. The islands of the Dutch East Indies are used as the series of these maps. Furthermore, the administrative regions and map subjects are considered as the sub-series of these maps. To some extent, this arrangement does not depict the functions and activities of the *topografische dienst* because the *topografische dienst* had varied functions, for instance, military service, politics, and economics. This arrangement does not effectively reflect the context of the *topografische dienst* in the Netherlands East Indies. Therefore, this arrangement should be revised. The arrangement should be based on map subjects, geographical area, and date because the *topografische dienst* in the East Indies had various functions of mapping.

Description is a further phase of producing the finding aids of the *topografische dienst*. It is defined as the intellectual process of depicting the content of maps. There are various hierarchies in describing maps of the *topografische dienst* in the East Indies, including, *fonds*, sub-series, and items. Nevertheless, these hierarchies are not inconsistent and unsystematic. It is supposed to be *fonds*, series, files, and items. The introduction of the inventory of the

topografische dienst's maps reflects the *fonds* description. The sub-series description utilizes three elements, such as title, quantity, and scale. The item description consists of numerous elements, including title, type of maps, scale, geographical references, size, color, methods of printing, publisher, edition, and date. However, the description elements should be improved by adding various elements, for instance, language, and cross-reference/ citation.

CHAPTER V.

CONCLUSION

Maps are important sources that depict spatial information about geographic areas. Crucial to both society and science, they have to be well arranged and described. They differ from other media because of their features and spatial information. They also have their own stories which reveal the context of the maps production because of the different situations in which they were created as well as the variety of types of maps. There are various methods to arrange and describe maps in order to provide a good retrieval aid without obscuring the context of maps. Providing retrieval aids of maps is a task of both archivists and librarians. Both professions have different perspectives and methods of arranging and describing maps. This thesis has scrutinized the arrangement and description of the maps originating from the *topografische dienst* from the perspectives of both archivists and librarians. The maps of the *topografische dienst* provide a fascinating case for the comparative study of archival and library science. These maps clearly illustrate the impact of context on arranging and describing.

The *topografische dienst* was a military mapping agency in the Netherlands and Netherlands East Indies. Both mapping agencies were reorganized due to their expanded functions and activities of mapping. Consequently, these reorganizations resulted on the context of map making. This context is important in arranging and describing maps from the perspectives of archival science. There are five provenances of the *topografische dienst*'s maps in the Netherlands and Netherlands East Indies: the Dutch *topografische dienst*, the Indies *topografische dienst*, Bodel Nijenhuis, the *Koninklijk Instituut voor Taal-Land- en Volkenkunde* (KITLV), and the *Koninklijk Instituut voor de Tropen* (KIT). These collections are stored and managed by the Leiden University library (UBL), the National Archives of the Republic of Indonesia (ANRI) and the National Archives of the Netherlands (NAN).

A context is considered important not only to arrange and describe maps but also to analyze the maps of the *topografische dienst*. This argument is allied with the point of views of archival studies, library science and geography. However, both archivists and librarians have different perspectives in determining the context of the *topografische dienst*'s maps. Archivists, on the one hand, consider the functions and activities of a creator agency as the parameters of its

context of creating archives, as suggested by Sir Hillary Jenkinson, and Sue Mc. Kemish.[237] Librarians, on the other hands, perceive the context plays important rule in cataloging and making classification as argued by Christopher Edmond Merret.[238]

Both social and institutional contexts are important for archival institutions and libraries because they facilitate good arrangement and description. The archivists of the NAN considered the functions and activities of the *topografische dienst* as a mapping agency. Therefore, the map subjects of the *topografische dienst* were employed to arrange maps. The system diverges from that recommended by Marijke Kok[239] and Ralph E. Ehrenberg[240] who contend that geographical area plays the most important role in arranging maps. The ANRI does not apply this method to the arrangement of the *topografische dienst*'s maps because they applied the original order from the *Dittopad*, the successor of the *topografische dienst* in the Netherlands East Indies that rearranged the maps of the *topografische dienst*. This case demonstrates that the social context can be important. One can observe how map arrangement changed from the colonial to the post-colonial era.

The institutional context can also be important. This is clearly apparent in the way that the UBL handles the maps of the *topografische dienst* from various map collections: Bodel Nijenhuis, the KITLV, and KIT. The librarians of the UBL accord primary importance to the aforementioned map collections as the provenances to catalog their map collections because there are three map collections that contain maps of the *topografische dienst* with different purposes of collecting maps. However, they utilize the geographical area to classify all of their map collections, including the maps of the *topografische dienst*. In other words, the UBL sacrificed the context of these provenances to facilitate access. Their method of classifying maps differs from that of Ralph E. Ehrenberg who contends geographical area, map subject, and date are consecutive elements to arrange maps. However, this method fails to preserve the context of the three map collections to collect maps.

Description is a further process of making finding aids of the *topografische dienst*. The NAN, UBL, and ANRI have different methods to describe the maps originating from the *topografische dienst*. With reference to the multilevel description as suggested by the ISAD-G

[237] Sue McKemmish, "Introducing Archives and Archival Programs": 10.
[238] Christopher Edmond Merret, *Map Cataloguing and Classification*: 10.
[239] Marijke Kok, "Beschrijving en Ordening van Kaarten in het Archief": 46-47.
[240] Ralph E. Ehrenberg, *Archives and Manuscripts*: 20-21.

and ISBD (CM), the NAN performs the multilevel description optimally although they do not utilize descriptive elements consistently at all levels. In the same way, the ANRI performs the multilevel description, even though the hierarchy is unsystematic. The ANRI describe on the level of item better than in the NAN. On the other hand, the three collections in the UBL describe the maps originating from the *topografische dienst* on the different description level, thus they have to be consistent in order to make user-friendly finding aids of the *topografische dienst*.

The institutional research of mapping agencies is considered important for archivists to determine the context of map archives because it is useful in curating and analyzing maps. Librarians are supposed to do research about the aims of the map collectors in collecting maps in order to preserve maps as bibliographic materials. Map subjects can be applied to arrange maps for the multiple-purposes of mapping agencies, while the geographical area can be employed to organize maps with the single goal of disseminating geographical knowledge. With regards to map description, multilevel description can be used to make user-friendly finding aids of maps.

This thesis provides an important contribution for both archival and library science in arranging and describing maps that are understudied. The *topografische dienst*'s maps provide a fascinating case for the comparative study of archival and library science. These maps come from five different provenances and are held and managed by archival institutions and libraries. Furthermore, they clearly depict the role of the context on arranging and describing maps.

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