Toponymic information system for description and classification of ethno-informatics of “kampung” naming in the East Priangan of West Java

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Abstract. The toponymy of naming places in social culture in certain places can describe the characteristics of the society in the past, therefore it is interesting to study how the ancestors of the society culture named their place. This research describes and classifies the naming based on the word structure, including prefixes, syllables it contains, and the complete word in the naming of a “kampung” which is covered in village, describing and classifying the meaning of the naming of the “kampung” based on particular categories, mapping the naming of the “kampung” on the map of the location, as well as developing the study location of the composition of the intersection of sets by taking the sample of “kampung” naming database in districts in East Priangan areas of West Java. The system development method used in this research is the waterfall software development method. Waterfall is a systematic classical model employed in developing software. The stages of Waterfall consists of Communication (Project Initiation & Requirements Gathering), Planning (Estimating, Scheduling, tracking), Modelling (Analysis Design), Construction (Coding and System Test), Deployment (Delivery, support, feedback), and Maintenance. The result of the study showed that 8,75% of the “kampung” names mostly start with the prefix “Ci”, “Pa”, “Su” with 8,75%, 9,62%, and 5,12% respectively. The syllable mostly contains the meaning of nature, place, feeling, and communication. The meaning of “kampung” naming represents the character of the society, which becomes the guidance for them in living their daily life: loving the nature and the environment, religious spirit, artistic soul, being hard worker, respecting the ancestors, soft feeling, and loving communicating. The result of the intersection of sets of the “kampung” names can help the researchers to determine the destination of the study location under the study, while the set composition describes the taking of each set composition which has the different number of the intersection of set members. The visualization of village naming makes the reading of “kampung” naming at each location of the research easy, both for the similarity and the typical nature of each area under the study.

1. Introduction
As information technology and communication are developing coupled with the increasing demand of the society in obtaining information for the purpose of broadening the knowledge in order to support daily activities or making a decision, the information system becomes the solution for obtaining information quickly and accurately. The Information System can be applied in various fields; Education, Economy, Health, Culture, Environment and many more.

The application of Information Systems in the field of culture has not been commonly used, while this is required in helping explore or maintain the cultural values in certain communities. One of the possible applications is shown by developing Toponymy Information Systems to know the meaning
of naming the “kampung” in East Priangan areas. This research took the data on “kampung” names in
villages at four districts covering Bandung, Garut, Tasikmalaya and Ciamis.

The result of Ethno-informatics on naming the “kampung” is expected to give the description on
the most names used for “kampung”, understanding the background of naming the “kampung” in the
sunda culture in East Priangan in particular, and in West Java in general. This research is expected to
provide feedback for the local government and the young generation of the future Sundanese people
and those who care about culture.

This study is aimed to research the role of informatics in culture (Ethno-informatics) especially the
Sundanese culture in East Priangan, to describe the followings:
1. Describing the names of “kampung” mostly used in 4 districts in East Priangan area of West
Java, based on word structure, prefixes, syllables contained and complete word of “kampung”
naming.
2. Classifying names of “kampung” based on various meaning categories of the “kampung”
names mostly used in four districts in East Priangan areas.
3. Locating the naming of the “kampung” into the location map, to compare the similarity and
typical nature in each location existing in 4 districts in East Priangan area West Java.
4. Developing and implementing the intersect set to seek the uniqueness for study research and
the composition of intersection of sets to see the similarity and typical nature of “kampung”
naming existing in the East Priangan area of West Java.

2. Method
In this study the theoretical basis supporting various theories of the information system is described.
Some experts from different sources define the information system as follows:

2.1. Ethno-informatics
“Ethno-mathematics is Mathematics applied among cultural groups, identified like national society,
tribe, labor group, kids starting from certain ages and professional classes” [1]. While Ethno-
informatics is the application of informatics into culture [2]. The role of informatics is shown by
exploring the database of “kampung” naming available at present, as described in the database of
one’s address in four districts in east priangan area of West Java.

To see the relationship between an object and another, the first law of geography is used stating
that an object must be in a relation to other objects, while a set of close objects has a higher level of
relationship [3]. This concept is combined with the concept of intersection of set defining that a
member of the intersection of set is at the same time a member of the intersection of set that it
intersects [4], which is the similarity in naming places among areas. Meanwhile, the members which
only exist in certain areas are called the typical naming of the regional place. These concepts are
shown in the development of the implementation of the “kampung” naming theorem in four districts
in the East Priangan region of West Java province.

2.2. Information System and Geographical Information System
According to [5] Information Systems are components which are interrelated and work together to
collect, process, store and spread information to support decision making, coordination, control,
analysis, and visualization in an organization. Another definition on Information Systems according to
[6] is that Information Systems are sets of interrelated components that collect, withdraw, process,
store, and circulate information to support decision-making and control in an organization.
Information Systems bear information on people, places, and important events within the organization
or the vicinity of the environment. With information, the data that have been formed become
something meaningful and beneficial for humans. Activities in Information Systems generate
information needed by organizations to make decisions, control operations, analyze problems, and
create new products or services.

The definition of a Geographic Information System from several experts and sources is as follows:
a Geographic Information System is a computer-based system or technology that is developed built
with function of collecting, storing, processing, and analyzing, as well as presenting data and
information from an object or a related phenomenon with its location or presence on the earth's
surface [7]. Geographical Information Systems have the ability to link various data at a particular
point on earth, combine them, analyze, and eventually map the results. The processed data are spatial
data, which are geographically oriented data and are locations that have certain coordinate systems.
Thus, Geographic Information Systems are able to answer questions such as location, conditions,
trends, patterns, and modeling [5].

2.3. Toponymy
RI Law No. 24 of year 2009 on the flag, language, national symbols, and national anthem in Article
36 mandates that Indonesian language must be used in geographic names in Indonesia and the
intended names can use local languages [8]. Knowledge of names is called onomastic. Onomastics
consists of two branches of study; anthroponomy, knowledge that studies the names of people, and
toponomy, knowledge that studies the origin of place names. Toponymy in English is called a
toonym which comes from the word "topos" which means "place" or "surface" as topography is a
description of the surface of places on earth. "Nym" comes from the word "onyma" which means
"name". Toponymy literally means the name of a place on earth. Toponyms are often called
“geographical names” or “place names” (place names) [9]. Meanwhile, in Indonesian language the
term "names of geographic elements” or "geographic names” or "topographical names” is applied.
According to Raper in [10] there are two definitions of toponym; the first definition is the science
whose object of study is about toponymy in general and about geographical names in particular. The
definition of the second toponym is the totality of the toponym in an area.

2.4. “Kampung”
According to RI Law no. 6 of year 2014 [11] on village, it is stated that "Village is a village and
customary village or what is referred to by other names, hereinafter referred to as village, which is a
legal community unit which with territorial boundaries which is authorized to regulate and administer
government affairs, the interests of the local community based on community initiative, rights of
origin and / or traditional rights recognized and respected in the government system of the Republic of
Indonesia". A Village is a village and traditional village or what is called by other names, hereinafter
referred to as a village”, therefore a “kampung” can be said as a village, however in Bandung district
at East Priangan, a “kampung” is a part of a village that has boundaries between “kampung” but in
terms of government affairs it is still managed by the government of the village, and village is a
combination of several "kampung”. “Kampung” is an area, in which there are several houses or
families who live there. “Kampung” is a typical traditional Indonesian environment, marked by the
characteristics of life that are intertwined in close familial ties [12].

Meaning is the implication or intention that is inferred from a word. Semantics is the study of
meaning in language [13]. Meaning is the implication or intention drawn from a word, the meaning of
the object is closely linked between one and another. If a word cannot be related to a particular object,
an event or a situation, we cannot derive the meaning of that word. There are several terms related to
the meaning of the word, namely the donative, the connotative, the lexical, and the grammatical
meaning.

a. Denotative meaning is the basic meaning, general, as it is, neutral, and does not interfere with taste
values, as well as is not figurative.

b. The connotative meaning is a figurative meaning that is together with a sense of value, social
attitude additions, personal attitudes from an era, and additional criteria given on a conceptual
meaning.

c. Lexical meaning is the meaning of the word as it is in the dictionary, the term lexical originates
from the lexicon which means dictionary. The meaning of the word according to the dictionary is
the word that has lexical meaning.

Grammatical meaning is the meaning of a word obtained from the results of grammar events, a
grammatical term from the word grammar which means grammar. Grammatical meaning as a result of
this grammatical event is often referred to as nosi. In [14], it is explained that semantics is directly
present in conversation, so semantics is included in the study of linguistics, which is easy to learn in
understanding culture. Previously [14] did not mention semantics as a linguistic study, but in his book
it is explained that “All this information has to be represented in the original sentence, according to
the port royal theory and semantic interpretation, the sentence must be continued”. Then he mentioned
again that semantics is a component of grammar, and the meaning of sentences is largely determined
by the semantic component. Semantics is a branch of linguistics that examines meaning or interpretation. Semantics as a branch of linguistics has the same position as other branches of linguistics [14].

2.5. The Waterfall software development method
The system development method used in this research is the waterfall software development method. Waterfall is a classic model systematically used to build software. This model was first introduced by Winston Royce in 1970 and is the most widely used model in Software Engineering (SE). It is called "waterfall" because each stage can only be passed after completing the previous stage and run sequentially [15].

![Figure 1. The stages of the waterfall model [15]](image)

Communication (Project Initiation & Requirements Gathering), services obtained from the system along with the system limitations and objectives set after consulting with users. All requirements are defined in details and made as system specifications.

a. Planning (Estimating, scheduling, tracking), the planning stage that involves identifying and explaining the system abstraction and its relationships, estimating processing time and scheduling.

b. Modeling (Analysis Design), at this stage the design of the design system that is to be made is made.

c. Construction (Coding and System Test), Programming is carried out, then unit testing to ensure each unit meets system specifications. After testing, the system will be presented to the user.

d. Deployment (Delivery, support, feedback). At this stage, installation and use of the system that has been created are executed. Maintenance that is done involves correcting system errors, repairing system units and improving system quality, then providing assistance to the user.

2.6. System Design using UML
Unified Modeling Language (UML) is a collection of models used to describe a system of software or software related to certain objects [16]. In this paper, one of the UML system designs used is an activity diagram, depicting the flow of a process, as well as parallel processes that may occur in some cases. Activity diagrams show system activity, not what users do when using the system. The following picture is shown in figure 2.
Figure 2. Activity diagram in recapitulation menu

Figure 2 shows the Activity Diagram for the Recapitation Menu, explaining the activities to get a recapitulation of village names, including word prefixes, contained syllables, complete words and data displays to calculate the number of village names.

2.7. Database Design

Structure Query Language (SQL) is a specialized type of programming language built to work with relational databases such as MySQL, Oracle, Microsoft SQL Server, PostgreSQL, Informix and others. MySQL is a programming language which is compatible with all available Relational Database Management System (RDBMS) products. In some cases, MySQL offers the best scenario that it can run on multiple platforms, which is low and stable [17]. This research also shows that the Entity Relationship Diagram (ERD) is a database design approach that begins by identifying important data called entities and the relationships between data that must be represented in the model [18].

Figure 3. Entity relationship diagram

Figure 3 shows the relationship between the database tables and the relationships between the tables, including the village table with the attributes of the kampung id and the village id, the sub-
district table consisting of the sub-district and sub-district id, the kampung table consisting of the “kampung” and “kampung” ID, and the meaning table consisting of the name and meaning ID.

3. Result and Discussion

3.1. User interface diagram for “Kampung” naming information system

The user interface is a display design for the information system to be built, in this program there is only a UI for the user. The menu structure of the program that is built is shown in figure 4:

![Menu structure of the “kampung” naming information system application](image)

Figure 4. Menu structure of the “kampung” naming information system application

Figure 4 shows the design of the User Interface menu structure for the “Kampung” Naming Information System application, consisting of the main menu and four submenus search, recapitulation, meaning and intersection of set, the search and recapitulation submenu which includes modules prefix, contained syllables, complete words and data display. The meaning submenu consists of a meaning search and data display module, while the intersection submenu includes the specificities of each region and the commonalities of all regions.

3.2. Programming language for “Kampung” naming information system

Information system application development used the C# programming language. C# is a flexible and powerful programming language with an interesting history. The C# programming language is an object-oriented programming language. Object is an organized mechanism that allows to divide the program into several parts, each of which is responsible for parts of the system as a whole. Projects created with an object-oriented design make large projects easier for design, testing and extension. It also enables the creation of programs that can have a high level of reliability and stability [19]. The database used is shown in table 1.

| No  | District Name | Number of “Kampung” |
|-----|---------------|---------------------|
| 1   | Bandung district | 3,722               |
| 2   | Ciamis district | 1,225               |
| 3   | Garut district  | 10,810              |
| 4   | Tasik district  | 6,964               |
|     | Total “kampung” at East Priangan | 22,721             |
Table 1 shows a recapitulation of the number of “kampung” names used, consisting of 3,722 for Bandung district, 1,225 for Ciamis district, 10,810 for Garut district, and 6,964 for Tasikmalaya district. The total “kampung” for the East Priangan area is 22,721 “kampung”.

3.3. The result of toponym “kampung” at East Priangan

The results of data processing from various forms are then interpreted, so they can produce knowledge, which can be used by management to help in supporting decision making.

3.3.1. The results of the processing grouped based on word structure

a. Grouping based on the prefix of the “kampung” naming word (Ci, Pa, Su).

The description of the results of data processing can be seen in Table 2 below.

Table 2. Percentage of “kampung” name in East Priangan based on prefixes

| No | District Name | Number of “Kampung” | Prefix Ci | Percentage | Prefix Pa | Percentage | Prefix Su | Percentage |
|----|---------------|---------------------|-----------|------------|-----------|------------|-----------|------------|
| 1  | Bandung       | 3,722               | 787       | 21.14      | 433       | 11.63      | 170       | 4.57       |
| 2  | Ciamis        | 1,225               | 304       | 24.82      | 92        | 7.51       | 119       | 9.71       |
| 3  | Garut         | 10,810              | 3,110     | 28.77      | 1,145     | 10.59      | 412       | 3.81       |
| 4  | Tasik         | 6,964               | 2,302     | 33.06      | 516       | 7.41       | 437       | 6.28       |
|    | Total Priangan| 22,721              | 6,533     | 28.75      | 2,186     | 9.62       | 1,163     | 5.12       |

Table 2 describes the description of the results of data processing grouped by the prefix of the “kampung” naming. The prefix used is the prefix “Ci”, “Pa” and “Su”. The three prefixes were taken based on an initial exploratory study of the “kampung” naming database. Table 2 shows that in total in the East Priangan area the “kampung” name prefix used is the Ci prefix, with almost 29% of “kampung” names starting from Ci prefix, for example Cibatu, Cipatujah, Cicapar and others. This shows that people in the East Priangan areas love water as an important part of their life. The prefix of the name Pa in “kampung”, almost 10% indicates that the culture of the people in the East Priangan region is hard working, Pa means that its purpose is for, for example Pameungpeuk, Pangalengan, Panyindangan and others. Meanwhile, the number of “kampung” with the prefix Su is 5%, for example Sukamulya, Sudimampir, Sukamanah, and others. This shows that people in the East Priangan region love virtue in their daily life.

b. The syllables contained in the naming of “kampung” in the East Priangan Area.

The results of data processing by classifying based on the syllables contained indicate that the ten syllables contained in the naming of “kampung” in the East Priangan region are:

Twenty Syllables Contained in the Naming of “Kampung” in the Priangan Timur Area = {Babakan, Suka, Pasir, Sindang, Bojong, Ranca, Mekar, Legok, Datar, Sawah, Mountain, Karang, Negla, Baru, Kubang, Batu, Sirna, Tanjung, Jati, Awir}

This shows that the people in the East Priangan region love their natural environment, shown by the words pasir, ranca, legok, mountains, tanjung, kubang, jati and awi. Love being sociable is shown by the names babakan, sindang, bojong, and has a soft feeling, shown with Suka and Mekar.

c. The processing results are grouped based on the most complete words, the name of the “kampung” as shown in in table 4.

The results of data processing done by classifying referring to complete words for “kampung” naming show that the most complete twenty words in “kampung” naming in the East Priangan areas are:
Twenty Complete Words for Naming “Kampung” in the East Priangan Areas = {Babakan, Mekarsari, Sindangsari, Bojong, Neglasari, Sukasari, Sukamulya, Kubang, Sukamaju, Negla, Cikadu, Sukahurip, Sukasirna, Nyalindung, Mekarjay, Sukamanah, Baru, Sinaragalihi, Ciawitali, Cibeureuh }

This shows that the complete naming of the “kampung” in the East Priangan region shows that people in East Priangan love their homeland as a place to live their lives, possess a hard working character to advance, use empathy in living their lives, love the environment, love local fruit products, and are used to communicating for deliberation.

3.3.2. Classification of the meaning of “kampung” naming based on semantic words
The meaning of “kampung” naming is obtained after classifying the “kampung” naming based on the semantics of the word and its meaning. In this study the meaning of the village is classified based on the 10 (ten) largest categories as follows:

Place = { Babakan, Gadog, Patrol, Banjar, Nangsi, Pondok, Baros, Dayeuh, Depok, Parung }
Feelings = { Suka, Mekar, Rasa, Kerta, Hurip, Rahayu, Mulya, Sono, Bagja, Mukti }
Communication = { Sindang, Warga, Pada, Simpang, Bale, Wargi, Jamban, Jaga, Saluyu, Baur }
Form = { Datar, Sarua, Kopeng, Bengkok, Buleud, Gereba, Joglo, Godebag, Beulah }
Effort = { Sawah, Kebon, Pangkalan, Warung, Talun, Kandang, Genteng, Samur, Pasar, Wangun }
Plant = { Awi, Caringin, Jati, Haur, Jawung, Bitung, Teureup, Buluh, Dangdeur, Tamiang }
Flower = { Tanjung, Campaka, Kembang, Kananga, Puspa, Angsana, Malati, Ligar, Mawar, Kamuning }
Fruit = { Kadu, Peundeuy, Muncang, Limus, Picung, Nangka, Kupa, Loa, Peuteuy, Kalapa }
Religious = { Kaum, Mulya, Pasantren, Bedug, Kurnia, Suci, Akad, Wakap, Berekah, Jariah }
Colour = { Beureum, Bodas, Biru, Hideung, Kondang, Herang, Koneng, Bungur, Borelang, Carulang }

This shows that the meaning of naming “kampung” in the East Priangan region of West Java, describes the character of the community, which can be a guide in carrying out their lives, the character of the people in East Priangan includes: loving the environment and their place of residence, having soft feelings, accustomed to communication, hardworking, loving beauty, have a religious spirit, and respect their ancestors.

3.3.3. The intersection of the name of the “kampung” at four districts in East Priangan
Table 1 above shows the number of members of the names of the “kampung” in each district in the East Priangan area with details:

- The number of members of the association of “kampung” names in the Bandung district has 3,722.
- The number of members of the association of “kampung” names in the Garut district there is 1,225.
- The number of members of the association of village names in the Tasikmalaya districts there are 10,810.
- The number of members of the association of village names in the Ciamis district there is 6,964.

If the names of the villages in the 4 districts are described as an intersection, then we obtained 13 study locations to be researched, shown in the following Venn diagram in figure 5.
Figure 5. Venn diagram for “kampung” naming at four districts at East Priangan

Figure 5 shows that there are 13 study areas that can be researched, namely a study of 4 locations of the specific members of each district, a study of 4 locations of 2 members of the intersection, a study of 4 locations of members of 3 districts and 1 study of locations of members of 4 districts hereinafter referred to as similarities.

If all the members in 13 locations each add up, then for the intersection of “kampung” names with the composition Bandung-Garut-Tasik-Ciamis, the number of members is 3,976. As for the composition of Bandung-Ciamis-Garut-Tasik, the total “kampung” name in 13 locations is 3,782. It can be concluded that if the composition for intersection is different, the number of members for each composition will be different.

3.3.4. The uniqueness of the full name of the “kampung” in the East Priangan area

The uniqueness of the “kampung” name in an area is the “kampung” names that exist only in that area. The results of data processing on “kampung” names show that the top ten “kampung” names which are typical in each district are as follows:

The uniqueness of the name of the “kampung” in Bandung District =\{ Bojongjati, Kukun, Lebakmuncang, Puncakmulya, Babakan stations, Babakansukamulya, Barutunggul, Bojong Kukun, Cimalenger, Cipongporang\}

The uniqueness of the name of the kampung in Ciamis District =\{ Kidul, Hanjungtivu, Jetak, Kaler, Kulon, Wetan, Banjarpinang, Bantardamai, Baregbeg\}

The uniqueness of the name of the kampung in Garut District =\{ Pamukiman, Barukai, Nangorak, Pasirjeungjing, Panagan, Bayubud, Datarmuncang, Pilar, Bera\}

The uniqueness of the name of the kampung in Tasikmalaya District =\{ Nangerang, Cinusa, Barengkak, Godebag, Jodang, Babakankarang, Babakankupa, Bagjasari, Balanjeur, Cirahong\}

The uniqueness or difference in naming the complete kampung in the East Priangan area or the uniqueness in each district, in terms of meaning, shows that even though there are differences, the people in the East Priangan area still respect and tolerate differences. Visualization of the uniqueness can be seen in figure 6.
Figure 6. The uniqueness of “kampung” names in Bandung district

3.3.5. The similarity of the full name of the “kampung” in the East Priangan Area

The similarity of “kampung” names in the East Priangan area is the names of “kampung” in the four districts, Bandung, Garut, Ciamis, and Tasikmalaya as can be seen in Figure 6. The results showed that there were sixty-four kampung names in the four districts. The top ten kampung names in the four districts are:

The similarity of the name of the “kampung” in the East Priangan Area = \{Babakan, Mekarsari, Sindangsari, Bojong, Neglasari, Sukasari, Sukamulya, Kubang, Sukamaju, Cikadu\}

The similarity in naming the complete kampung in the East Priangan area or the similarity in 4 districts in the East Priangan area, in terms of the meaning of “kampung” naming, shows that the East Priangan people have a sense of togetherness in terms of loving their homeland as a place to lead their lives, character of hard worker to advance, use empathy in living their life, love the environment, love local fruit products, and are used to communicating for deliberation, and cooperating. Visualization of similarity or togetherness can be seen in figure 7.

Figure 7. Similarity of “kampung” names in Bandung district
4. Conclusion

The result of Ethno-informatics Information System in East Priangan can give a recommendation to the government for culture and tourism studies, especially to explain that the “kampung” names relative constant and it has a deepest meaning for life. The meaning of naming the “kampung” in the eastern region of Priangan, West Java, describes the character of the people living in the community, which can be a guidance in leading their life, the character of the people in East Priangan includes: loving nature and the environment, shown by loving their place of residence, animals, plants, a religious spirit, an artistic soul, hardworking, respectful to their ancestors, soft-hearted, intelligent shown by understanding the number system, time, direction, color and shape, and enjoy communicating.

The results of applying the intersection of set can make it easier for researchers to determine the number of study areas under the study, while the set composition illustrates that each composition has a different number of set members for each composition of the set taken. Mapping the “kampung” names in each study location can make it easier to read the “kampung” names in each study location, both in the form of similarity between the study areas and the uniqueness of each study area, therefore it can be used by researchers as material for decision making in selecting the study location.

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