

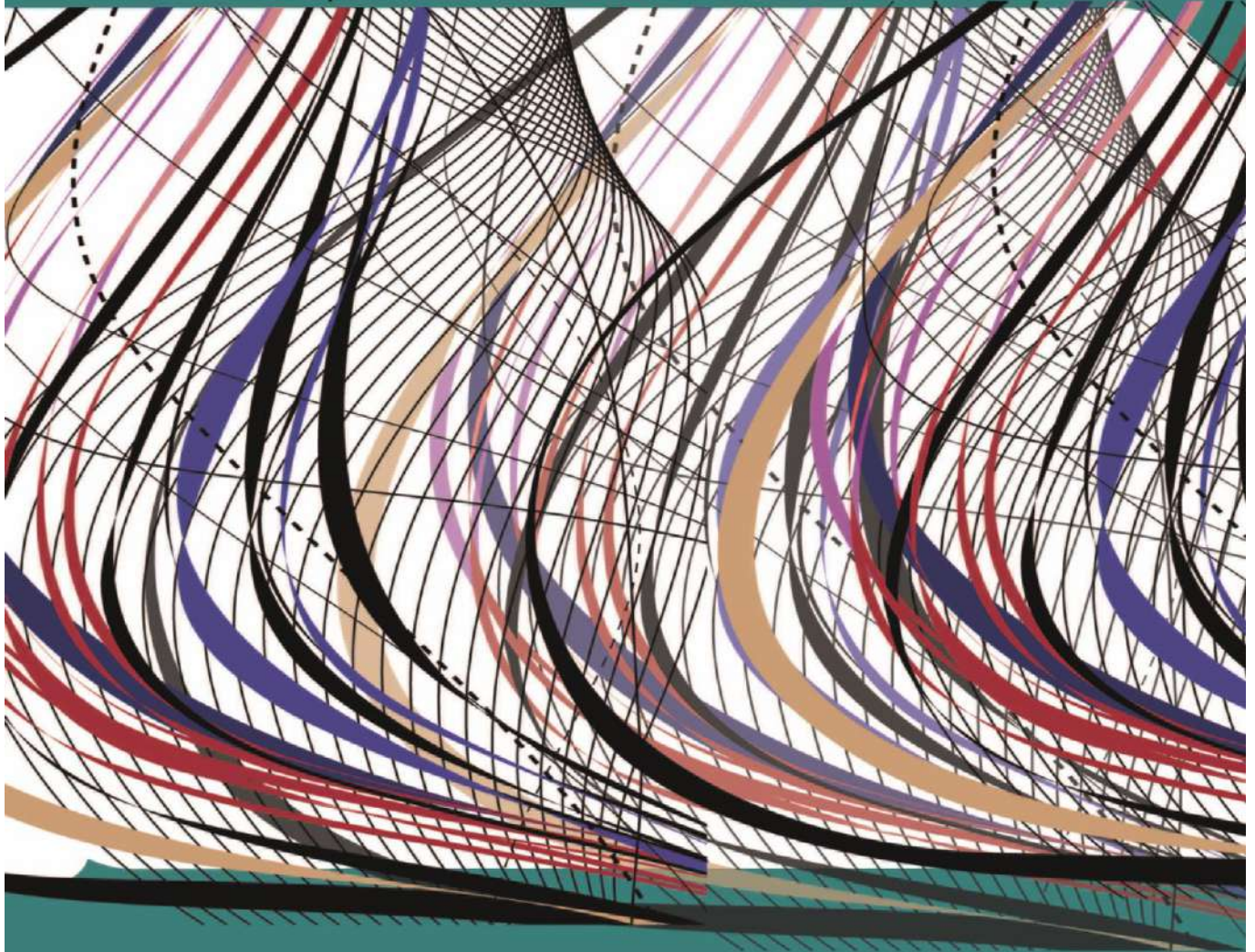
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*Editor in Chief*

Dr. Dinh Tran Ngoc Huy

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# FOREWORD

I am pleased to put into the hands of readers Volume-6; Issue-8: Aug, 2020 of “**International Journal of Advanced Engineering, Management and Science (IJAEMS)** (ISSN: 2354-1311)”, an international journal which publishes peer reviewed quality research papers on a wide variety of topics related to Science, Technology, Management and Humanities. Looking to the keen interest shown by the authors and readers, the editorial board has decided to release print issue also, but this decision the journal issue will be available in various library also in print and online version. This will motivate authors for quick publication of their research papers. Even with these changes our objective remains the same, that is, to encourage young researchers and academicians to think innovatively and share their research findings with others for the betterment of mankind. This journal has DOI (Digital Object Identifier) also, this will improve citation of research papers.

I thank all the authors of the research papers for contributing their scholarly articles. Despite many challenges, the entire editorial board has worked tirelessly and helped me to bring out this issue of the journal well in time. They all deserve my heartfelt thanks.

Finally, I hope the readers will make good use of this valuable research material and continue to contribute their research finding for publication in this journal. Constructive comments and suggestions from our readers are welcome for further improvement of the quality and usefulness of the journal.

With warm regards.

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# Identification of Dominant Plants in Forest Ecosystems in some Manado State University Land as Explorative Learning Reference

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**Abstract**— This study aims to determine the dominant plant species in forest ecosystems in several Unima lands and to explore scientific concepts and processes that will serve as references in the explorative learning process. This type of research is a type of exploratory research. The method used in this study is qualitative. The object in this study is the dominant plant in the forest ecosystem in several Unima fields. Based on the analysis of vegetation that has been carried out to determine the dominant plants in the forest ecosystem in the front of the Unima new workshop and the land at the bottom of the Unima Auditorium, the dominant plants are Bankruptcy (*Spathodea campanulata*), Forest Betel (*Piper aduncum* L), Nest Nest *Asplenium nidus* and Aren (*Arenga pinnata* Merr). After knowing the dominant plants, then the concept of science and the scientific process are formulated based on facts or phenomena about the dominant plant in the form of a matrix that will be used as a reference in explorative learning.

**Keywords**— Plants, Vegetation Analysis, Explorative Research.

## I. INTRODUCTION

Forests in general can be interpreted as an area that has a lot of dense plants which include trees, shrubs, ferns, grass, mushrooms, and so on and occupy a fairly large area. According to Law No. 41 of 1999 concerning forestry, the definition of forest is a unified ecosystem in the form of a landscape of land containing biological natural resources that are dominated by trees in a natural environment that cannot be separated from one another. Forests are one of the sources of life that protect the earth for the sake of the continuity of human life on earth, forests are also the lungs of the world with various types of plants in them that maintain the availability of oxygen on earth and absorb carbon dioxide (Rivilio, 2010).

Plants are one of the most abundant organisms in the forest in the form of trees, bushes, ferns, grass, and others. Plants have chlorophyll or leaf green substance which has a function as a medium for the photosynthesis process or making food. Not only food that it produces, but plants can also produce oxygen (O<sub>2</sub>) and convert carbon dioxide (CO<sub>2</sub>) produced by

humans and animals into oxygen (O<sub>2</sub>) that can be used by other living things. (Ferdinand, 2009)

The relationship between plants and forests and wildlife is very close. According to Rusdianan and Lubis (2012), a forest is an ecosystem unit that is closely related to natural processes that are interconnected between the components of the ecosystem. The ecosystem is an ecological system that is formed because of the mutual relationship that cannot be separated between living things and their environment. The ecosystem is a combination of each biosystem unit that involves a reciprocal relationship between organisms and the physical environment so that the flow of energy into certain biotic structures that cause the material cycle of organisms within organisms.

Manado State University (Unima) is one of the state universities located in the North Sulawesi Prevention and precisely on the Tonsaru Tataaran hill, Tondano. Unima is categorized as a green campus because the natural conditions around the Unima campus are still awake with lots of trees and

other plants. Because Unima is located in the hills there are many types of plants that live around the campus, which causes the campus atmosphere to be cool. The Unima campus forest as one of the potential assets for the sustainability and comfort of the campus in terms of knowledge, beauty, and the environment has not yet been fully developed, especially in the use of forests as a source of explorative learning. The surrounding environment or the natural environment can be used as a learning resource to develop the potential of students to find the causes of events around them and look for facts in the surrounding environment (Komalasari, 2013). Explorative learning is learning that emphasizes student activity and is thought to be able to improve students' understanding of communication skills. Explorative learning begins with understanding the problem, analyzing, making guesses, and then making conclusions. In exploratory learning, students are allowed to construct their knowledge by building their constructs, then looking for answers based on the ideas and facts learned. (Rohmat, 2017)

Based on the above thinking, it is necessary to introduce the forest ecosystem as a source of exploratory learning, which is very important to understand the nature of forests and the diversity that is found in forests, especially for diverse plants. Researchers, in this case, will utilize plants that live in the forest ecosystem around the Unima campus as a reference to be used as a reference point in explorative learning, as well as discovering the science concept of certain plants that live in the forest ecosystem in several Unima fields. Based on the description above, the researcher will identify the dominant plants as a source of reference for explorative learning that will be packaged in the form of relationships of facts / natural phenomena that are around.

## II. RESEARCH METHODS

This type of research is a type of exploratory research. According to Fathoni (2005), explorative research is a study that intends to conduct an assessment or introduction of certain symptoms. In this research, theoretical references are not needed and hypotheses are not yet used. Explorative research is a study by tracing, especially in stabilizing concepts that will be used in a wider scope of research with greater conceptual reach (Yusuf, 2017). The object in this study is the dominant plant. Data collection techniques used in this study are observation and documentation as well as instruments used in observation sheets and documentation sheets. Measurements made in this study use vegetation

analysis techniques to determine the dominant plants in the forest ecosystem on the land. Forest vegetation analysis is a way to find out how large is the distribution of various species in an area through direct observation (Binari, 2011)

## III. RESEARCH RESULT

Manado State University is located on the hill of Tonsaru Tondano, Minahasa Regency, North Sulawesi Province, covering an area of 270 hectares with an altitude of 800 meters above sea level. On Manado State University Campus, there are 7 faculties scattered around Unima land with a considerable distance. Unima is categorized as a green campus because the natural conditions around the Unima campus are still awake with lots of trees and other plants. Due to the location of Unima in the hills, many species of plants live around the campus, so researchers are interested in making Unima land as a place of research and data collection on the dominant plants that exist around the Unima campus.

### Explore Science Concepts and Processes

According to (Medellu, C. 2019) at the stage of exploring scientific concepts and processes there are five stages, namely:

1. Detailed observations of the phenomenon of components - components that interact affect the phenomenon

There are two fields used by researchers as research sites, the conditions in these two fields are different, the land in front of the Unima workshop building at the coordinates of  $1^{\circ} 16'08.11''$  LU  $124^{\circ} 53'09.34''$  BT has a land condition that is not too sloping, there are various types plants and land cover plants and dense trees. While the land at the back of the Unima auditorium building has sloping land conditions, there are only a few species of vegetation and cover plants and trees that are not too dense.

2. Identifying variables influencing phenomena and relationships between variables based on scientific concepts and processes

The results of identification carried out by researchers on these two fields, the factors that affect plants are what can be seen are sunlight, water, and humidity, and factors that can be measured that affect plants are air temperature and soil pH. The instrument used to measure air temperature is the LM-8000 digital instruments and the instrument to measure soil pH is a 4 in 1 soil meter. These factors are very influential in the growth and development of plants both from seeds to mature plants.

## 3. Take measurements in the field of variables

Based on the research that has been carried out, the results of the calculation of plant parameters in the land in

front of the Unima Workshop building on a 20 m X 20 m plot as presented in the following table:

Table 1. Composition of vegetation types in front of the Unima Workshop building

No	Name of Vegetation Type	Tree	Stake	Seedling	Under	amount
1	Bankruptcy ( <i>Spathodea campanulata</i> )	√				14
	Banyan ( <i>Ficus Benjamina</i> )					
2	Ara ( <i>Ficus fistulsa</i> )	√				2
3	Money Tree ( <i>Pachira aquatic</i> )	√				2
4	Bankruptcy ( <i>Spathodea campanulata</i> )	√				2
	Durian ( <i>Durio zibethinus</i> )					
5	Betel Forest ( <i>Piper aducum</i> )		√			9
	Wood Macis ( <i>Albizia julibrissin</i> )			✓		
6	Betel Forest ( <i>Piper aducum</i> )		√			3
7	Wood Macis ( <i>Albizia julibrissin</i> )		√			1
8	Bankruptcy ( <i>Spathodea campanulata</i> )		√			3
	Dog Mercury ( <i>Mercurialis perennis</i> )			✓		
9	Betel ( <i>Piper caducibracteum</i> )			√		4
10	Bird's Nest Nail ( <i>Asplenium nidus L</i> )		✓	√		3
			✓			
11			✓	√		3
			✓			
12					√	3
13					√	3
14					√	9
	TOTAL					61

Relative Density, Relative Frequency, Relative Dominance, and Vegetation INP at the Tree level in the front area of the Unima Workshop building. In *Spathodea campanulata* there are 14 stands with a diameter of 45, 31 cm, and INP of 170, 96%. In *Ficus Benjamina* trees there are 2 stands with a diameter of 67, 28 cm, and INP of 65, 97%. In *Ficus fistulsa* trees there are 2 stands with a diameter of 16, 72 cm, and INP of 31.42%. In *Pachira Aquatica* there are 2 stands with a diameter of 17, 04 cm, and INP of 31.64%. Thus the

highest INP value for the tree level is found in the *Spathodea campanulata* tree with an INP of 170.96%.

Relative Density, Relative Frequency, Relative Dominance, and Vegetation INP at the stake level in front of the Unima Workshop building. At the plant level of *Spathodea campanulata*, there were 9 stands with a diameter of 2, 93 cm, and INP of 139, 01%. In-plant stakes, *Durio zibethinus* amounted to 3 stands with a diameter of 3, 32 cm, and INP of 67, 52%. In plants, the level of *Piper aducum* is 2 stands with diameter 2, 71 cm, and INP of 36, 88%. In plants, the level of

Albizia julibrissin was 3 stands with a diameter of 2.12 cm and INP of 19.09%. Thus, the highest INP value for the sapling level is found in Spathodea campanulata plants with an INP of 139, 01%.

Relative Density, Relative Frequency, and INP Vegetation at the seedling level in front of the Unima Workshop building. In the seedling level of Piper aducum, there are 4 stands with INP of 88, 88%. In Albizia julibrissin plants amounted to 3 stands with INP of 66, 66%. In the plants, Spathodea campanulata amounted to 2 stands with an INP of 44.44 %. Thus, the highest INP value for the seedling level was found in the Piper aducum plant with an INP of 88.88%.

Relative Density, Relative Frequency, and Vegetation INP at the lower level in the front area of the Unima Workshop

building. In table 4.5 shows the results of observations of lower plants in the plot 2 mx 2 m there are 15 lower level plants and 3 types of lower level. In the lower level plants Mercurialis perennis amounted to 3 stands with INP of 40%. In the lower plants Piper caducibracteum amounted to 3 stands with INP of 40%. In the lower plants of Asplenium nidus there are 9 stands with an INP of 120%. Thus, the highest INP value for the lower level is found in Asplenium nidus plants with an INP of 120%.

Based on research that has been carried out on the forest ecosystem in the lower part of the Unima Auditorium, the results of the calculation of plant parameters in the lower area of the Unima Auditorium in the 20 m X 20 m plot are presented in the following table.

Table 2. Composition of vegetation types in the lower part of the Unima Auditorium

No	Name of Vegetation Type	Tree	Stake	Seedling	Under	amount
1	Candlenut ( <i>Aleusrites moluccanus</i> ) Banyan ( <i>Ficus Benjamina</i> )	√				4
2	Aren ( <i>Arenga pinnata</i> ) Bankruptcy ( <i>Spathodea campanulata</i> )	√				4
3	Aren ( <i>Arenga pinnata</i> ) Rambutan ( <i>Nephelium lappaceum</i> )	√				7
4	Aren ( <i>Arenga pinnata</i> )	√				1
5			√			6
6			√			2
7				√		20
	TOTAL					44

Relative Density, Relative Frequency, Relative Dominance, and Vegetation INP at the Tree level in the lower part of the Unima Auditorium. In Aleusrites moluccanus trees, there are 4 stands with a diameter of 61, 704 cm, and INP of 84.32%. In the Ficus Benjamina tree, there are 4 strands with a diameter of 54.3 cm and an INP of 80.2%. In Arenga pinnata trees there are 7 stands with a diameter of 36.71 cm and INP of 107, 92%. In Spathodea campanulata trees there is 1 stand with a diameter of 27, 07 cm, and INP of 27, 55%. Thus, the

highest INP value for tree-level is found in Arenga pinnata trees with INP of 107, 92%.

Relative Density, Relative Frequency, Relative Dominance, and Vegetation INP at the sapling level at the bottom of the Unima Auditorium. In-plant Arenga pinnata saplings amounted to 6 stands with a diameter of 21, 23 cm, and INP of 218, 61%. In-plant stakes, Nephelium lappaceum amounted to 2 stands with a diameter of 9.71 cm and INP of

81, 39%. Thus, the highest INP value for the sapling level is found in *Arenga pinnata* plants with an INP of 218.61%.

Relative Density, Relative Frequency, and INP Vegetation at the seedling level in the lower part of the Unima Auditorium. In the *Arenga pinnata* plants amounted to 1 stand

with an INP of 200%. Thus the highest INP value for seedling level is found in *Arenga pinnata* plants with an INP of 200 %.

Relative Density, Relative Frequency, and Vegetation INP at the lower level in the lower part of the Unima Auditorium as a result of observation of lower-level plants in the 2 m X 2 m plot there were no lower-level plants.

#### 4. Conduct data analysis and interpret the processes that occur in dominant plants

Table 3. Important Value Index at the tree, sapling, seedling, and lower level in the front area of the Unima workshop building.

No	Species name	Number of Types	Diameter (cm)	INP (%)
1	<i>Spathodea campanulata</i>	14	45.31	170.96
2	<i>Spathodea campanulata</i>	9	2, 93	139.01
3	<i>Piper aducum</i>	4	-	88.88
4	<i>Asplenium nidus</i>	9	-	120

Based on observations made to find out the dominant plants in the land in front of the Unima workshop building, seen from the highest important index value (INP) of these plants. Then an important value index was obtained at the tree level found in *Spathodea campanulata* plants at 170.96%, at the sapling level there were at *Spathodea campanulata* plants at 139, 01%, at the seedling level there was at *Piper aducum*

plants at 88, 88%, and at the level, bottom is found in plants *Asplenium nidus* by 120%.

The second land in this study is located at the bottom of the Unima Auditorium where the land is quite large, therefore a measurement of important value index (INP) is needed in this case on a tree stand with the same plot on the first land of 400 m<sup>2</sup>.

Table 4. Importance Value Index at the tree, sapling, seedling and lower level in the area under the Unima Auditorium


No	Species name	Number of Types	Diameter (cm)	INP (%)
1	<i>Arenga pinnata</i>	7	36, 71	107.92
2	<i>Arenga pinnata</i>	6	21.23	218.61
3	<i>Arenga pinnata</i>	20	-	200
4	-	-	-	-


Based on observations made to determine the dominant plants in the lower part of the Unima Auditorium, it is seen from the highest important index value (INP) of these plants. Then obtained an important value index at the


level of trees contained in *Arenga pinnata* plants at 107, 92%, at the sapling level found at *Arenga pinnata* plants at 218.61%, at seedling levels found at *Arenga pinnata* plants at 200%, and at lower levels not there are types of plants.

5. Formulate concepts and networks of science process concepts based on the results of data analysis and references


Table 5. Explorative Infiltration Capacity

Facts / Phenomena	Variable	Exploration of scientific concepts and processes				Synthesis Analysis
		science concept			Science process	
		Physics	Chemistry	Biology		
 Kecrutan ( <i>Spathodea campanulata</i> )	Sunlight, wind, water, and soil	<ul style="list-style-type: none"><li>•Temperature</li><li>•Blush</li></ul>	<ul style="list-style-type: none"><li>• pH</li></ul>	<ul style="list-style-type: none"><li>• <i>Spathodea campanulata</i> Plant Classification</li><li>• Plant Morphology of <i>Spathodea campanulata</i></li><li>• How to breed <i>Spathodea campanulata</i></li><li>• Benefits of <i>Spathodea campanulata</i> Plants</li></ul>	<p>Sunlight is one important factor that plants need from seed to tree. The role of light for seeds is to warm the seeds so they don't rot in moist conditions. <i>Spathodea campanulata</i> has a cigar-like shape. When the fruit is dry the fruit will open and release thin seeds that have wings. Then the seeds will fly with the help of the wind until they reach the ground. Water and soil are also very important for the growth process of <i>Spathodea campanulata</i> both from seeds to trees. Seeds that have fallen on the ground will absorb water until the seeds increase in size and become soft. Water can be obtained from soil moisture or rainwater. After that, the seeds will continue to grow until they become a</p>	<p><i>Spathodea campanulata</i> is a tree from Africa which is usually planted as a protective plant on the roadside and also grows naturally in secondary forests in high forest zones, deciduous forests, transitions, and savannahs in Africa. <i>Sparthodea campanulata</i> is one of the mainstay names of Indonesian citizens as green plants. This tree is able to cool the surrounding environment with its towering characteristics. Aside from being greening, <i>spathodea campanulata</i> trees are often ornamental plants. This tree is fast growing and the woody trunk is not hard, can continue to grow well until it reaches a height of 10 to 35 meters. This plant has a large red hemaphrodite and an inner orange. When the buds, the flowers are curved and contain red sap. The petiole is short with a thickness of about 0.7 cm. Equipped with Juda with striking lenticels on the rachis. For its own history, the <i>Spathodea campanulata</i> plant was named by Fuchs in 1542. <i>Campanulata</i> itself has the meaning of plants with rounded crowns and</p>

					tree. For sunlight, water and soil will continue to be needed by <i>spatodea campanulata</i> both to carry out the process of photosynthesis and its survival as well as wind to assist in the distribution of <i>Spathodea campanulata</i> seeds.	broad grounds such as church bells.
 <p>Sirih Hutan ( <i>Piper aducum L</i> )</p>	Sunlight, wind, water and soil	<ul style="list-style-type: none"> <li>• Temperature</li> <li>• Humidity</li> </ul>	<ul style="list-style-type: none"> <li>• pH</li> </ul>	<ul style="list-style-type: none"> <li>• Plant Classification <i>Piper aducum L</i></li> <li>• Plant Morphology of <i>Piper aducum L</i></li> <li>• How to breed <i>Piper aducum L</i>.</li> <li>• Benefits of <i>Piper aducum L</i> plants</li> </ul>	<ul style="list-style-type: none"> <li>• All living plants must need sunlight, water and soil for their survival. Plant <i>Piper aducum L</i></li> <li>• not only does it require sunlight, water and soil, but it also requires wind to spread the seeds. <i>Piper aducum L</i>.</li> <li>• is a monocot plant or has single seeded seeds? Seeds that are blown by the wind will fall on the ground; germination will occur if the seeds of <i>Piper aducum L</i> fall in a place that has enough water, sunlight, and oxygen. After the seeds have fallen</li> </ul>	<p><i>Piper aducum L</i> is one type of plant from Piperaceae family, who came from South America and entered Indonesia was estimated in 1860. <i>Piper aducum L</i> is known in Sunda by the name Seuseureuhan. This plant is a bush or</p> <ul style="list-style-type: none"> <li>• small trees that can grow well at an altitude of 90-1000 m above sea level in the grove of forests and secondary forests, on the banks of rivers and cliffs. <i>Piper aducum L</i> can grow and develop in areas with temperatures between 24 and 30 ° C, with rainfall 2,345 mm. <i>Piper aducum L</i>.</li> </ul> <p>is a plant shrubs, woody stems, height can reach 2-8 m. Ovoid-shaped leaves pointed tip, leaf base rounded, leaf edges flat on each book, hairy stems, cylindrical-shaped measuring 3-9 cm,</p>

					into a proper place, there will be a process of imbibition in the seeds or the entry of water into the seed cells. After that, the plant organs will appear namely the root organs, leaves, and the tips of the stem or young shoots. Then it will continue to grow until it becomes an adult plant that already has flowers and is ready to reproduce. The process is inseparable from the help of sunlight, water, and soil.	leaf length 12-20 cm. The betel root system of the forest is a taproot.
 <p><i>Asplenium nidus</i></p>	Sunlight, soil, water, and wind	<ul style="list-style-type: none"> <li>•Temperature</li> <li>•Humidity</li> </ul>	<ul style="list-style-type: none"> <li>• pH</li> </ul>	<ul style="list-style-type: none"> <li>•Classification of <i>Asplenium nidus</i> plants</li> <li>•Plant Morphology <i>Asplenium nidus</i></li> <li>•How to breed <i>Asplenium nidus</i> plants</li> <li>•Benefits of <i>Asplenium nidus</i> plants</li> </ul>	<p><i>Asplenium nidus</i> is a type of fern whose lives are also highly dependent on sunlight, water, and soil and wind. As with other plants <i>Asplenium nidus</i> utilizes sunlight, water, and nutrients in the soil for photosynthesis, while the wind is used by <i>Asplenium nidus</i> to help spread spores. Spores - flown by the wind will develop into ferns if they fall in a</p>	<p><i>Asplenium nidus</i> is commonly known as the bird's nest fern. Habitat <i>Asplenium nidus</i> is on terrestrial and epiphytic trees, found at altitudes of 1,100 m asl to 1,500 m asl. Having a variety of sizes, a small size of about 7 cm long, with a width of 3 cm. While the large length can reach 120-150 cm, with a width of 26-30 cm. This type of nail plant has erect rhizome. Colored petiole black. The simple leaf blade shape, tufted, rosette shape with a pointed end,</p>

					<p>place that provides nutrients or other elements such as the availability of water and sunlight. <i>Asplenium nidus</i> spores that are blown by the wind not only fall on the ground there are also attached to the tree then the spores that attach to the right tree can also grow and develop then the ental - the enthrall of <i>Asplenium nidus</i> will dry to form a kind of nest that hitches a ride on tree branches and this nest is storing water so <i>Asplenium nidus</i> does not lack water. <i>Asplenium nidus</i> that lives on other trees is called epiphytic plants or plants that are riding on other plants as their place of life.</p>	<p>hard and slippery texture. Leaf color part the paler bottom with brown stripes along with the leaf bone child. On the lines, these are spores attached. The stalk is very short and invisible because it is covered by fine hairs. The layout of leaves arranged in very short, circular stems forms a basket. Planting a leaf which is circular on the stem when viewed from the side looks like a bird's nest.</p>

 <p><i>Arenga pinnata</i></p>	<p>Sunlight, water, soil, and insects</p>	<ul style="list-style-type: none"> <li>•Temperature</li> <li>•Humidity</li> </ul>	<ul style="list-style-type: none"> <li>• pH</li> </ul>	<ul style="list-style-type: none"> <li>•<i>Arenga pinnata</i> Plant Classification</li> <li>•Plant Morphology of <i>Arenga pinnata</i></li> <li>•How to breed <i>Arenga pinnata</i> plants</li> <li>•Benefits of <i>Arenga pinnata</i> Plants</li> </ul>	<p>Sugar palm or areca palm ( <i>Arenga pinnata</i> ) is a part of the areca nut branch that breeds by seed. Like other plants, sugar palm also needs sunlight, water, and soil for survival such as photosynthesis and growth and development of seeds. Sugar palm also needs help from insects in the process of pollinating male and female flowers to produce palm fruit. Ripe fruit has a brownish yellow color and will fall to the ground. Each fruit has 3 seeds in its fruit. After falling, the flesh of the fruit will rot and only the seeds remain and the seeds will grow young shoots and continue to develop until they become mature sugar palm. Sugar palm plants do not need special soil conditions, so they can grow on clay (clay), calcareous and sandy soil, or soil conditions that are nest or can continue the excess water.</p>	<p>Aren ( <i>Arenga pinnata</i> ) belongs to the <i>Arecaceae</i> tribe (areca nut), a closed seed plant (Angiospermae). Palm trees can be found starting from the west coast of India, to the south of China and the Guam islands. Sugar palm habitat is also widely found in the Philippines, Malaysia, the Assam Plain in India, Laos, Cambodia, Vietnam, Burma (Myanmar), Sri Lanka, and Thailand. In Indonesia, there are many palm plants and are scattered throughout the archipelago, especially in humid hilly areas. Enau or palm ( <i>Arenga pinnata</i> ) is the most important palm after coconut (palm) because it is a multipurpose plant. This plant is known by various names such as nau, hanau, pululuk, biluluk, mourn, juk, or palm fiber. Palm sugar is a type of annual plant, sized large, solitary tree shaped up to 12 m high, diameter at breast height (DBH) up to 60 cm (Ramadani. 2008). Palm trees can grow to reach a height with a stem diameter of up to 65 cm and a height of 15 m and even reach 20 m with a canopy that rises above the stem (Soeseno, 1992). When the tree is still young the sugar palm tree has not been seen because it is covered by the base of the leaf midrib, when the lowest leaf has fallen, the trunk starts to appear. The surface</p>
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						of the stem is covered by black fibers that come from the base of the petiole. According to Ramadani in 2008 stated that pollination of sugar palm was allegedly not done by angina but by insects.
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Facts or phenomena are determined from the object of research, namely the dominant plants in each of these fields and the researcher determines the variables that affect the dominant plants. From the facts or phenomena and variables that have been determined are further explored into science concepts and science processes. The results of the exploration of concepts and scientific processes are then analyzed for synthesis through measurement or observation and reference analysis in the form of books, research results or journals, and related internet sources. Facts or phenomena are bankruptcy plants ( *Spathodea campanulata* ), forest betel ( *Piper aducum L* ), bird's nest nails ( *Asplenium nidus* ) and sugar palm ( *Arenga pinnata* ), variables that affect these plants, namely sunlight, wind, water, and soil, as well as the concepts of science could be found such as temperature, humidity, pH, tum classification harbor, plants morphology, how to breed plants and benefit of plants.

#### IV. CONCLUSION

Based on the results of research and discussion, it can be concluded:

(1) The dominant plants in the forest ecosystem in front of the Unima Workshop veil are bankruptcy plants (*Spathodea campanulata*) at the tree and sapling level, forest betel plant (*Piper aducum*) at the seedling and plant level bird's nest nails (*Asplenium nidus L*) on the lower level. Whereas on the land under the Unima Auditorium the dominant plants are sugar palm (*Arenga pinnata*) at the level of trees, saplings, and seedlings. For lower plants, no plants are found.

(2) From the results of the exploration of concepts and scientific processes in dominant plants and the synthesis analysis obtained, they have been used as a reference in the explorative learning process in the target student group.

#### V. REFERENCES

- [1] Binari, Manurung, R. Tarigan, dan Z. Simatupang. (2011). Panduan Ekologi tumbuhan. Medan : FMIPA Unimed
- [2] Fathoni, A. (2005). Metode penelitian dan teknik penyusunan skripsi. Garut: PT Rineka Cipta
- [3] Ferdinand F., Ariebowo M. (2009). Praktis Belajar Biologi 1. Jakarta: Pusat perbukuan Departemen Pendidikan Nasional.

- [4] Komalasari, K. (2014). *Pembelajaran Kontekstual. Konsep dan Aplikasi*. Bandung: PT Refika Aditama.
- [5] Pemerintah Indonesia. (1999). Undang – Undang Nomor 41 Tahun 1999 tentang Kehutanan. Lembaran RI Tahun 1999 No. 41. Jakarta: Sekretariat Negara.
- [6] Rivilino, R. E. (2010). Manajemen Konflik Pertahanan Alih Fungsi Hutan Adat Desa Sungai Ekok Kecamatan Rakit Kulim Kabupaten Indragiri Hulu Tahun 2010. Universitas Riau, 3-4.
- [7] Rohmat, I. (2017). Penerapan pembelajaran eksploratif untuk meningkatkan kemampuan pemahaman dan komunikasi matematis siswa SMP. Seminar Nasional Indonesia, 55.
- [8] Rusdianan, O. dan Lubis R. S. (2012). *Pendugaan Korelasi antara Karakteristik Tanah Terhadap Cadangan Karbon (Carbon Stock) pada Hutan Sekunder*. Jurnal Silviculture Tropika vol 03 (1) : 14-2
- [9] Yusuf, Muri. (2017). *Metode Penelitian (Kuantitatif, Kualitatif dan Penelitian Gabungan)*. Jakarta: Kencana

# Problems in Bureaucratic Planning Process Supporting Quality of Public Services

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**Abstract**— The article aimed to analyze and describe the process of public service management in DPM-PTSP Gorontalo in terms of its organization planning process. The research method used was qualitative. Data analysis used was interactive model analysis consisting of three analysis components i.e. 1) data reduction, 2) data presentation and 3) data verification and conclusion drawing.

Research findings indicated that the planning process should be supported by the rule of law aspect. The enforcement in rule of law as the research findings was as follows: 1) service mechanism in DPM-PTSP required regulating power to optimize organizational function, 2) the regulation aspect should be reviewed adequately to ensure legal protection was given to service innovation made by employees, 3) regulations available in DPM-PTSP Gorontalo were overlapping. It restricts the director to stipulate planning standards as one of the corrective acts in DPM-PTSP services, 4) rule of law could selected mechanism and protect all employees, so a transparent, accountable, effective and efficient public service could be achieved and 5) optimization in regulation might elevate public service quality, develop an investment climate and increase both regional and national economic growth.

**Keywords**— Public Service Management, Planning Process, License.

## I. INTRODUCTION

### 1.1. Research Background

Licensing procedures in Indonesia are complicated and hard to trace, blocking any business activities. There are numerous types of licensing in Indonesia. The problem in understanding who has the authority and responsibility is still difficult to deal with. People still have no idea of, ex. who is responsible for their license, whether it is the regency, province, or the state. The authority problem commonly relates to the type of business being run, capacity, and the business area.

Bureaucracy should not only serve the public but also manage public policy. It greatly contributes to making public policy as well as policy implementation, strengthening, and evaluation. To solve problems in the convoluted licensing service, the government founded a licensing organization to eliminate any public stigma that public service by the government gives much trouble; such as convolution, confusing requirements, and inflexible regulation.

Gorontalo is progressively advancing from year to year in terms of infrastructure and enterprise establishment, either conventional or modern. It implies more investors

are investing in this particular area. Therefore, the government of Gorontalo established *Organisasidan Tata Kerja Unit Pelayanan Perizinan Satu Atap* (English: Organization and Work Procedure of One-stop Licensing Service Unit). The organization and work procedure was then developed into an integrated licensing service center or DPM-PTSP. It is determined to ease the licensing process in Gorontalo and draw interests of small micro-medium enterprise actors and non-Gorontalo investors. It optimizes its role as a public service organizer by continuously optimize service mechanism in accordance with two primary service principles i.e. easy and simple. As a result, the public as the economic actors are satisfied due to fulfilled demand. DPMP-PTSP relies on the Law Number 25 of 2009 on Public Service to organize their service.

Based on our observation on the quality of public service in DPM-PTSP Gorontalo, their public service concept did not comply with the goals of Good Governance and was not well implemented. The implications of the bureaucracy are ineffective and inefficient performance of employees. Besides, apparatus resources provide incompetent services. Mentality and

intention to provide public services are also still minimum. We found several problems in DPM-PTSP i.e.:

Firstly, DPM-PTSP was only equipped with limited human resources. Employees worked daily and served at least 10-20 applicants, either licensing or non-licensing applicants. The employees were overwhelmed in providing services. Consequently, piling documents were in the ticket window. It took 15-20 minutes to serve one client who needed consultation. Many of the applicants had to be willing to wait all day long.

Secondly, employees lacked information about licensing and non-licensing service implementation in DPM-PTSP. In consequence, employee competence was uneven. Some employees, especially front officer placed in the service window did not thoroughly understand several licensing and non-licensing points frequently asked by applicants. The undetailed answers baffled them. They were suggested to have a consultation with back officers or the director. Consequently, applicants should repetitively go to the Center and submit any required files due to unclear requirement explanation. Employees lacked knowledge, as they did not have any educational background required. They came from different *Organisasi Perangkat Daerah* (English: Regional Apparatus Organization), even some of them were teachers. They were suddenly instructed to serve public license, a job they never dealt with. Therefore, it took a long time to uniform their perception and knowledge. They had to comprehend all licensing subjects, from registration, licensing requirements, payment to file retrieval.

Thirdly, the online system DPM-PTSP currently implemented through *Portal Kota Gorontalo* did not provide enough easiness for public, making them complain. Public found errors while accessing the site, as the service providers did not respond and were temporarily inactive sometimes. Consequently, people should re-input their data. Furthermore, the system did not give enough information about the licensing management component and the licensing itself, so face-to-face consultation in the Center was preferable.

Fourthly, communication between people and applicants was ineffective. Our findings indicated that there were several people complained of unclear information DPM-PTSP employees provided for. Employees requested their phone numbers and told them that they would be informed by phone when their licensing file was ready. However, the information was not received after one or even two weeks later. The lateness made people actively ask and search for any required information. In addition, in-licensing which needed field

survey; such as Building Permit, they had to wait for the survey which was never done.

We also found other issues i.e. a) Some heads of department in the Local Government of Gorontalo were unwilling to give their authorities to DPM-PTSP Gorontalo, b) In term of licensing process, DPM-PTSP Gorontalo should be granted accessibility to each department, so they could request assistance to the departments while needing a professional opinion or help in managing licensing files. DPM-PTSP had limited human resources. They did not have experts in certain subjects; such as engineer, environmentalist, medical worker, and others, c) There was regulation disharmony. DPM-TSP was established based on the Regulation of the Minister of Home Affairs Number 20 of 2008 on Guidelines for Local Organization and Integrated Service Work Procedures. Meanwhile, there was another regulation which was President Regulation Number 27 the year 2009 on PTSP in Capital Investment. The regulation dealt with the same objects but with different authorities and regulations, creating overlapping regulations. In terms of authorities, there were two instructors which were the Minister of Home Affairs and the Capital Investment Coordinating Board with two overlapping authorities.

We were informed by the data that Gorontalo Public Service Compliance Standards had declined. Data released by Ombudsman of the Republic of Indonesia in 2017 confirmed that public service compliance standards in Gorontalo were severe (red). The Ombudsman assumed the severity was due to weaknesses and ineffectiveness in public service which, obviously required corrective acts. Service transformation the government gave through DPM-PTSP had been well implemented regardless of violations and unwillingness to serve showed by the apparatuses. For example, in terms of the license, many people proposed reporting files to Ombudsman, complaining how hard it was to get a license when the legislation clearly stated that all instance authorities were in one integrated service unit.

Based on potential investment data in Gorontalo we collected in the Central Bureau of Statistics of Gorontalo, 1) Tourism sector was one of the iconic sectors that might boost Gorontalo Local Own-source Revenue. Gorontalo tourism had attracted both domestic and international tourists, so the government should be determined to develop the sector. Facilities and management for tourism destinations were still inadequate, so both government and private institutions should cooperate in their development. Potential investment might be in luxurious hotels, tourism-travel agency, entertainment facilities, recreational places, and art and

culture studio; 2) the Health sector was also one of the most prioritized programs in Gorontalo. Ensuring public health, the Health Office continuously made efforts in the implementation of early disease diagnosis. The efforts were manifested in various health activities. The cardiac medical center had been available in *RumahSakitUmum Aloe Saboe* Gorontalo. However, Gorontalo had few hospitals, causing many patients to remain abandoned. Available hospitals could not treat and take care of all patients due to insufficient medical tools and drugs. The hospitals, especially the private ones should also suffer from lack of investment, medical facilities, drug distribution, and health workers, 3) Most industry sectors in Gorontalo were home industries developed based on their human resources' competence and skills. The local government had supported the existing home industries and encouraged them to develop. Besides, the government also gave relevant training, making the industries able to innovate and thus able to compete with other industries in other regions. The most prominent industry in Gorontalo was furniture, snack, and *karawo* embroidery industries. The investment opportunity might be up to 60% (furniture and snack) and 4) In terms of the trading sector, there were two enterprise units i.e. micro and small-medium enterprises. The two enterprise units came with varied investment values. All of those enterprises were managed and regulated by the local government with their ownership/legality status. The potential investment might be made in mall development (Central Bureau of Statistics of Gorontalo, 2018).

The data we had elaborated implied some potentials the government could be managed and developed to sustain local economic growth. Unfortunately, the potentials were not optimized due to challenges in the licensing process. For instance, home industries were dominant in Gorontalo. If the government was eager to enlighten them to get a legal license, they would earn another income from the income tax paid by the industries. The industries did online marketing and did not pay any tax.

Therefore, to enhance local potencies through investment growth, an effective and efficient management process in DPM-PTSP Gorontalo is required. Terry (2000) formulates four measuring indicators i.e. 1) Planning: a basic process in which management determines the goals and methods to achieve them, 2) Organizing: how management groups their activities. Each group is equipped by a leader given authority to manage his/her group, 3) Implementing: how management motivates group members so they are willing and struggling to reach the organization goal and the organization member goals

and 4) Monitoring/controlling: how management determines what to achieve and evaluate as well as determines corrective acts if necessary, ensuring all activities to be in line with the plan.

## 1.2. Research Objectives

Based on the research context, our research problem deals with public service management in *Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu* (English: Investment and One-stop Licensing Service Office) Gorontalo in term of its planning process.

## II. RESEARCH METHODS

The research method used was qualitative. Data analysis used was interactive model analysis consisting of three analysis components i.e. 1) data reduction, 2) data presentation and 3) data verification and conclusion drawing (Miles and Huberman, 1992).

Key informants were 1) director, front officer, back officer and staff of DPM-PTSP Gorontalo, 2) applicants and 3) members of Regional House of People's Representatives (DPRD) Gorontalo.

## III. RESEARCH FINDINGS AND DISCUSSION

A reliable service area should satisfy the public by its services. Therefore, as a public policy stakeholder, bureaucracy should develop integrity in its services. Planning in the development of public service quality aimed to assess that the latest innovation and program was applicable. Besides, planning aimed to assist management while adapting to changes in environmental. Furthermore, it also helped management face the main problems and enabled the director to understand the whole picture of the organization. In addition, it contributed to placing employees in accordance with their capability and in giving operational instructions correctly.

Effendy (2015:84) proposed four reasons why planning was necessary. The four reasons were: 1) Planning was the director. Planning directed employees and gave them knowledge of where the organization should be run into and what they should do to achieve the organization's goals. The employees might be led to nowhere or opposite directions when planning was absent. As a result, an organization would make no progress, 2) Planning could anticipate the impact of changes. Planning could motivate employees to look further, to anticipate changes, and to consider the effects. Planning could make consequences clear, 3) Planning could minimize any

wasteful activity. Planning eliminated financial waste and overlapping activities. Besides, facilities needed and goals would be clear, ineffectiveness would be revealed and corrected or eliminated and 4) Planning was a measure. Planning could be used to control an activity implementation. Violation, if happening, might be easily identified and corrective acts could be immediately taken. Furthermore, the director might be able to compare actual performances to the organization target and to identify violations and to take necessary corrective acts. Controlling was impossible without planning.

Therefore, the first step to take should be the implementation of simple and easy service procedures which are in accordance with the applicable regulation. Brief and efficient service procedures will punctuate the service, making it finished on time. Law Number 25 of 2009 demands service standards applied in all government institutions which manage public services.

Our informants conveyed that planning was necessary for the organization to anticipate any future challenges. One of the DPM-PTSP employees explained the most anticipated challenge which was to design a licensing and non-licensing service system that was quickly integrated, simple, and punctual. The design should comply with applicable regulations. Therefore, the director of DPM-PTSP Gorontalo should evenly distribute licensing services to all instances in Gorontalo. The distribution was eventually taken into account and regulated by the Regulation of the Mayor of Gorontalo Number 4 of 2017 on Delegation of Licensing and Non-licensing Services to Investment and One-stop Licensing Service Office. Finally, there were 92 types of licensing delegated to DPM-PTSP Gorontalo in 2018.

Anticipating the development of technology, DPM-PTSP Gorontalo made an innovation in its e-government-based service. They had used applicable technology to manage licensing documents since early 2018. Our data showed that licensing and non-licensing documents successfully managed were 4,104 in 2017 and rapidly increased by 4,523 prior December 2018. The number would hopefully increase at the end of December 2018.

DPM-PTSP had launched an application *Sicantik* (abbreviated form of *CerdasLayananPerizinanTerpaduuntuk Public*, or Smart Integrated Licensing Service for Public). The application helped people manage licenses for business or non-business activities. In addition to ease people, the licensing service was more efficient and faster. People could also control to what extent their documents had been processed.

In addition to *Sicantik*, DPM-PTSP Gorontalo also had used an application *Online Single Submission (OSS)* directly integrated with the central government. By the application, all licensing activities were accessible and could be monitored by the central government. As a result, investment development could also be directly monitored by the central government, either by the Ministry for Economic Affairs, Commercial Ministry, or BKPM. Both applications had been operated. Furthermore, DPM-PTSP had released an electronic signature facility, enabling all licenses could be managed online although the director of the Office was absent. They could get his/her signature using their smartphone. It was then expected that there would be no licensing service postponed after the facility was released. DPM-PTSP hoped that people would no longer find difficulties in getting a license to develop their business and find a solution with a minimum fee.

One of our informants, a member of the Regional House of People's Representatives Gorontalo mentioned that Gorontalo was being one of the cities which drew investors' interests. Numerous investors had gradually invested in Gorontalo. DPRD, with the local government, was highly committed to developing Gorontalo. In terms of regulation, DPRD and local government had managed the development well. The local government had issued a regulation on buildings, a regulation which determined how investors were allowed to make an investment in Gorontalo. Therefore, when having a discussion with the local government, DPRD studies all kinds of stuff about investment thoroughly and carefully. As a result, small and large investors planning to invest in Gorontalo would earn profit and be aware of investment regulations applied in Gorontalo. Investors were well welcomed by DPRD. They could help in economic growth in Gorontalo and hired many people. Gorontalo had been widely known as a service city. Investors might hold the impression.

We viewed that service innovation offered by DPM-PTSP Gorontalo could be implemented as long as it complied with the regulation. Various aspects, including regulation, should be considered. The regulation consideration was the most fundamental issue, as a government organization should be in accordance with the legal rule. Many innovations offered by local heads made them violate legal acts. Thus, innovations made should be reviewed and agreed by local heads, ministries, and the president. Besides, necessary regulation was required to protect policies to be issued.

We found these following planning processes i.e. 1) Determining the organization goals, 2) Developing logics for future conditions, and 3) Implementing the planned activities and evaluate the result. We proved that

planning for licensing and capital investment service management policy in DPM-PTSP Gorontalo had been in accordance with applicable legislation and mechanism. One of the planned services that had been implemented was to make all types of licensing available in all SKPD in Gorontalo were delegated to DPM-PTSP. The delegation was successfully managed after the issuance of the Regulation of Major Number 4 of 2017 on Delegation of

Licensing and Non-licensing Services to Investment and One-stop Licensing Service Office. Eventually, 10 types of licensing in 2017 were leveled up to 92 at the end of 2018. All licensing was delegated to DPM-PTSP Gorontalo. The government wanted to change the public perspective that the licensing service was not complicated, wasting time, ineffective and inefficient anymore. As a result, investors would put more interest and increased economic growth.

Table.1: Findings in Public Service Management Planning by DPM-PTSP Gorontalo

No.	Assessed Aspect	Research Findings			
		Plus		Minus	
		Findings	Implication	Findings	Implication
	Planning process	The issuance of the Regulation of Major Number 4 of 2017 on Service Authority Delegation to DPM-PTSP Gorontalo	92 types of licensing were successfully managed (the early types managed were ten)	Overlapping regulation which hampered the organization performance	Director should consult to more people while making a decision, prolonging the service
		Increase in the number of licensing and non-licensing services	Investment in Gorontalo increased	-	-

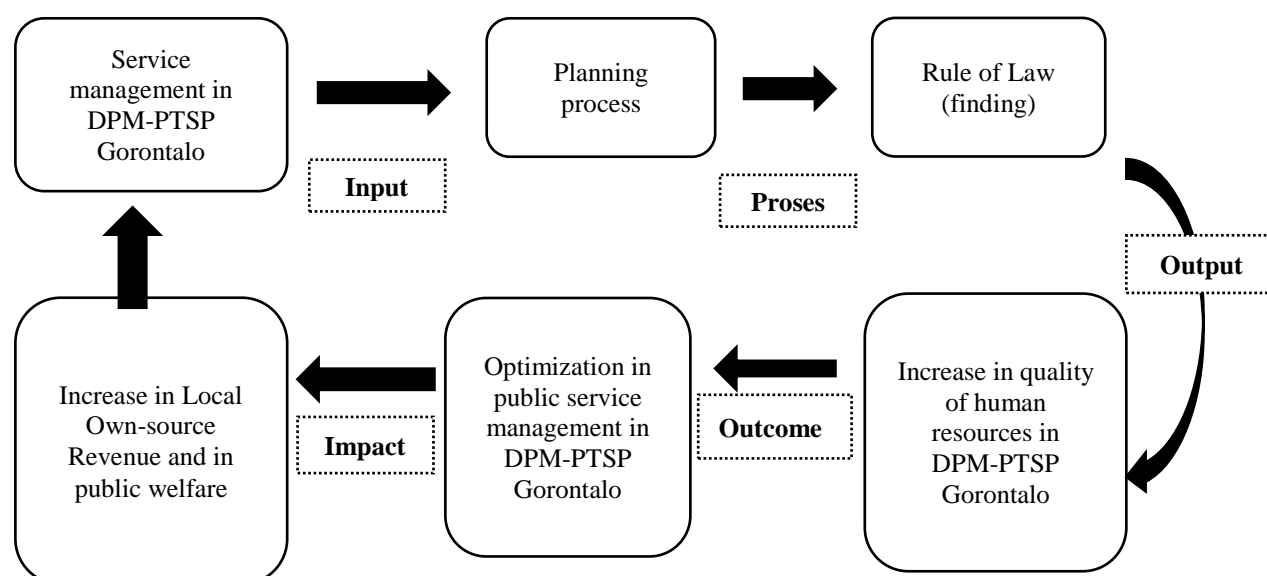


Fig.1: Findings in Public Service Management Planning by DPM-PTSP Gorontalo

The findings were in line with Siagian (2012), that planning constituted all logic processes regarding

future actions performed to achieve the set goals. Terry (2002) supported in her statement that planning was the

process of selecting and linking evidence, of making and using assumptions to formulate and design certain activities that were potentially required to achieve a certain goal.

Referring to the experts' arguments, our assumption was correct that Rule of Law was an integral part of a planning process conducted by the organization, or DPM-PTSP Gorontalo in term of public service. Rule of Law constituted a process that determined how the organization achieved a certain goal. Planning should be proportional to the regulation concerning how public services were run. The Director of DPM-PTSP could not operate the public services optimally if there were overlapping regulations. Rule of Law might the solution to bureaucratic challenges in the organization. As a result, transparent, accountable, effective, and efficient public service could be realized.

Regulation by the government of Gorontalo was expected to increase their local own-source revenue through income in the taxation sector. It might contribute to national economic growth as well. Gorontalo should have a distinguishing characteristic as a city offering services. There were numerous banking offices, financing offices, universities, clinics, and drug stores, restaurants, hotels, tourist destinations, night entertainments, service providers, and goods suppliers in Gorontalo. It indicated that investors and micro small medium enterprises were more interested in making an investment in Gorontalo than in other regencies in Gorontalo. In geographic terms, Gorontalo was the provincial capital and in the infrastructural term, the city was well-facilitated, making it one of the strategic locations to invest. In addition, despite its smaller area, Gorontalo remained the most populous city throughout the province.

#### IV. CONCLUSION

Our findings stated below, indicated that the planning process should be supported by the Rule of Law aspect. They were: 1) Service mechanism in DPM-PTSP required regulating power to optimize the organization function, 2) Regulation should be constantly reviewed by employees, ensuring their service innovation was legally protected, 3) Regulations available in DPM-PTSP Gorontalo were overlapping. It hampered the director to determine planning standards as one of the corrective acts for services provided by DPM-PTSP, 4) Rule of Law could select the effective mechanism and provide protection for all employees, so future challenges in term of realizing transparent, accountable, effective and efficient public services could be resolved and 5) Optimization in

regulation could increase the quality of public service, develop investment climate and accelerate either regional or national economic growth.

#### V. SUGGESTIONS

We proposed several suggestions i.e. 1) The local government may use e-government service to minimize technical error in the implementation of licensing mechanism, 2) The local government should coordinate to the central government and draw both national and international investors' interests in investing in Gorontalo and 3) Licensing mechanism should be simplified to eliminate any overlapping regulation, so investors will be more interested in investing in Gorontalo.

#### REFERENCES

- [1] Effendi Usman. 2015. *Asas-asas Manajemen*. Second printing. PT. RajagrafindoPersada.
- [2] Law Number 25 of 2009 on Public Services.
- [3] Miles and Huberman. 1992. *Analisis Data Kualitatif* (translated by Tjetjep Rohedi Rosidi). Jakarta: Universitas Indonesia.
- [4] Siagan Sondang. 2012. *Fungsi-fungsi Manajemen*. Jakarta: Bumi Aksara.
- [5] Terry R. George. 2000. *Asas-asas Manajemen* (translated by Winardi). Bandung.
- [6] Peraturan Menteri Dalam Negeri Nomor 24 tahun 2006 tentang Pedoman Penyelenggaraan Pelayanan Terpadu Satu Pintu.
- [7] Peraturan Menteri Dalam Negeri Nomor 20 tahun 2008 tentang Pedoman Organisasi dan Tata Kerja Pelayanan Terpadu di Daerah.
- [8] Peraturan Walikota Gorontalo Nomor 4 Tahun 2017 tentang Pelimpahan Kewenangan Pelayanan Perizinan dan Non-perizinan

# The Effect of Female Leadership Competency, Organizational Culture and Work Motivation on Apparatus Performance in the Government of Gorontalo District

Nirmala Afrianti Sahi, Arifin Tahir, Rauf A. Hatu, Rosman Ilato

**Abstract**— The performance of government apparatuses was important in the implementation process of government organization activities and programs. Several aspects such as organizational culture, work motivation, and leadership were influential in the implementation. The objectives of this research were to analyze and to find whether or not female leadership competency, organizational culture and work motivation directly affected the performance of government apparatuses. This was quantitative research using exploratory survey method. Data were collected using questionnaire and interview. Data were analyzed using PLS (Partial Least Square) approach with an assistance of SmartPLS 3.1 application. The findings showed that female leadership competency, organizational culture and working motivation did not have any significant direct effect on the performance of government apparatuses. However, female leadership competency gave an indirect significant effect on the performance of government apparatuses, mediated by both working culture and work motivation.

**Keywords**— Female Leadership Competency, Organizational Culture, Work Motivation, Apparatus Performance.

## I. INTRODUCTION

Apparatus performance is crucial in the continuant implementation of government organization activities and programs. The bad and the good of apparatus performance affect the performance of government organization. Consequently, a high expectation for the apparatus of government performance is increasingly showed off from time to time, along with the increase in public demand and expectation for the improvement of government organization performances. Therefore, it is inevitable that apparatuses have to improve their performance to fulfill both public demand and public expectation.

As a performance variable, culture is considered a part of organizational system. In this context, it is regarded as an object which is alive in an organization and binds all organization members to achieve common goals. Meanwhile, it is also considered a part of organization environment affecting the organization behavior and performance. On the other hand, leadership factor in performances of apparatus and organization is important when organization members are facing highly dynamic problems and continuous changes driven by technological

progress. A keyword of this leadership factor is the ability to affect organization members. A leader should effect his/her colleagues to show high performances to achieve organizational goals. The success or even the failure of an organization is mostly determined by the factor.

In addition to organizational culture and leadership above, Buhler (2004:191) expressed his opinion about the importance of motivation to improve apparatus performances. He argues that basically, motivation is a process determining how many efforts should be made to carry out a work. Motivation is very important in effort-making to achieve the goal. Apparatus performance greatly depends on organization's ways of generating strong motivation for them.

The improvement of apparatus performance through the development of organizational culture, of leadership competence, and the increase in apparatus work motivation become an issue in which not only public administration experts, but also the local governments in Indonesia are interested. The governments have made efforts to continuously improve their performance, as the bureaucratic performance in Indonesia is widely recognized to be at a desperate condition by many parties.

Some experts i.e. Robbins (2002) and Hatch (1997) concluded the importance of organizational culture in improving apparatus performance. Furthermore, Greenleaf (2002) and Sedarmayanti (2010) had proposed a culture-based local wisdom to support employee performances.

Efforts to improve apparatus performance in the government organization, both in central and regional level, are affected by leadership competence of the organization. The concept is in line with the concept proposed by Rondinelli (1998), Piercy and Morgan (2000), Dwiyanto (2006), Moenir (2002) and Tjiptono (2002). Another similar concept is proposed by Growe and Montgomery (1999), Tan (1991) and Stelter (2002). The concepts convey that leadership competency of women is equal with men's. Besides, woman leadership is accompanied with feminism, a special characteristic only belonging to women. The nature of feminism is that it is more effective to improve subordinate performances.

In addition to organizational culture and female leadership competency, improvement in apparatus performance is also affected by the level of work motivation apparatuses have. Organization is expected to provide motivation for employees, so they will be able to improve service quality which eventually leads to better apparatus performance. However, if motivation is given incorrectly, apparatus performance will decline. Furthermore, frustration, hatred, anxiety and dissatisfaction will emerge. In contrast, if given correctly, work motivation will lead to the improvement in apparatus performance. The correlation between motivation and apparatus performance is supported by Ahmed, Nawaz, Iqbal and Usman (2010) in their research on Motivation and Impact on Job Performance in 2010 at Pakistan. They declare that there is a significant correlation between motivation and job performance. Djumino (2010) and Caroline H (2007) conducted similar research. They investigated the correlation between motivation and performance was conducted. From both research, we understand that motivation gives a significant effect on apparatus performance. In other words, motivation is important to improve apparatus performance in addition to leadership and organizational culture.

Based on the aforementioned explanation, apparatus performance is at least affected by three variables i.e. female leadership competency, organizational culture and work motivation. However, we are interested in

doing a research on whether or not those variables affect the improvement of apparatus performance in the government of Gorontalo District. The objective of this research is to find the effect of female leadership competency, organizational culture and work motivation on apparatus performance in the government of Gorontalo District.

## II. RESEARCH METHODS

This research used quantitative design with explanatory survey method using data analysis of Partial Least Square (PLS) with the assistance of software smart PLS 3.0. Analysis unit in this research was all apparatuses in five local government organizations at Gorontalo District led by women officials i.e. Education and Culture Service, Husbandry and Animal Health Service, Food Security Service, Finance Agency, and Inspectorates, with a total population of 535 people.

Sampling technique was proportional stratified random sampling; while the minimum sample size from population was determined using Slovin formula (Mulyadi, 2016:115). Minimum samples of this research were 100 respondents. The number of sample selected in each stratum was determined using proportional allocation proposed by Harun Al Rasyid in Mulyadi (2016: 116). Samples obtained in each stratum were as follows: 4 respondents from echelon III officials, 16 respondents from echelon IV officials, 3 respondents from functional officials, and 77 respondents from staffs.

Primary data were obtained using questionnaires, interview and observation. Data analysis referred to steps proposed by Ghazali and Latan (2015:47-54). There were 7 steps proposed steps i.e. forming a structural equation model, creating a flow diagram, estimating the model, bootstrapping, evaluating the model and interpreting model.

## III. FINDINGS AND DISCUSSION

### 1. The Result of Validity and Reliability Tests on the Goodness of Fit of Measurement Model

The result of goodness of fit test of measurement model for female leadership ( $\xi$ ) variable can be seen in Figure (1).

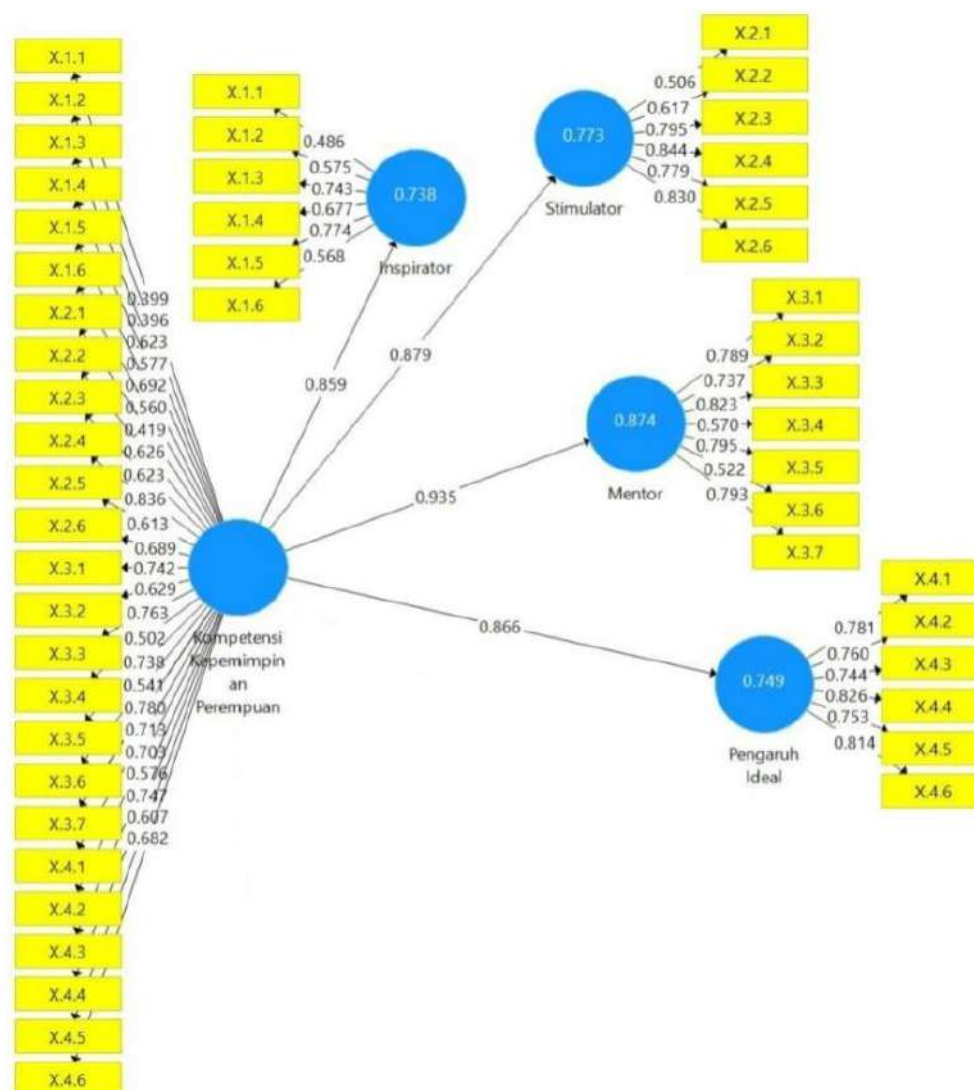


Fig.1: Loading Factors of the Variable Female Leadership Competency

According to the result of validity test (loading factors) above, of 25 indicators, there was one indicator (questionnaire number 1//X<sub>1.1</sub>), which was an indicator from inspiratory dimension, with the loading factor value lower than 0.50. Therefore, it was necessary to retest this model by removing the indicator from the analysis because it did not fulfill the value of convergent validity. In addition to construct validity test, construct reliability test was also performed to present each model forming dimension for the variable female leadership competency

that was reliable. It is based on the value of Cronbach's Alpha from all dimensions which was higher than the limit value of Cronbach's Alpha reliability test (higher than 0.70). It was the same as the result of Composite Reliability test which was higher than the test limit value (higher than 0.70).

The result of the goodness of fit test of measurement model for the variable organizational culture ( $\Omega_1$ ) can be seen in Figure (2).

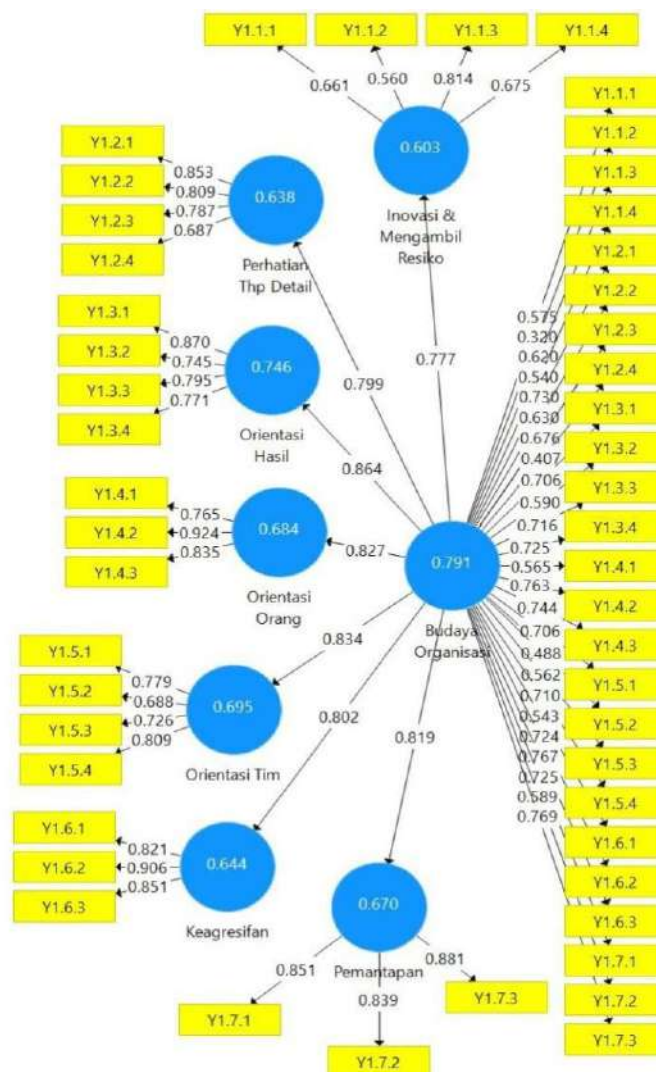


Fig.2: Loading Factors of the Variable Organizational Culture

The result of validity test showed that construct indicator from the variable organizational culture was valid. Meanwhile, the result of reliability test showed that each model forming dimension for organizational culture variable was reliable. It can be seen from the value of the reliability test on both of Cronbach's Alpha and Composite Reliability test values of five model forming dimensions of the variable Organizational Culture tested. The value was

above 0.6 or above the limit value of reliability test which was  $> 0.5$ .

The result of the goodness of fit test of measurement model for the variable work motivation ( $\Pi_2$ ) can be seen in Figure (3):

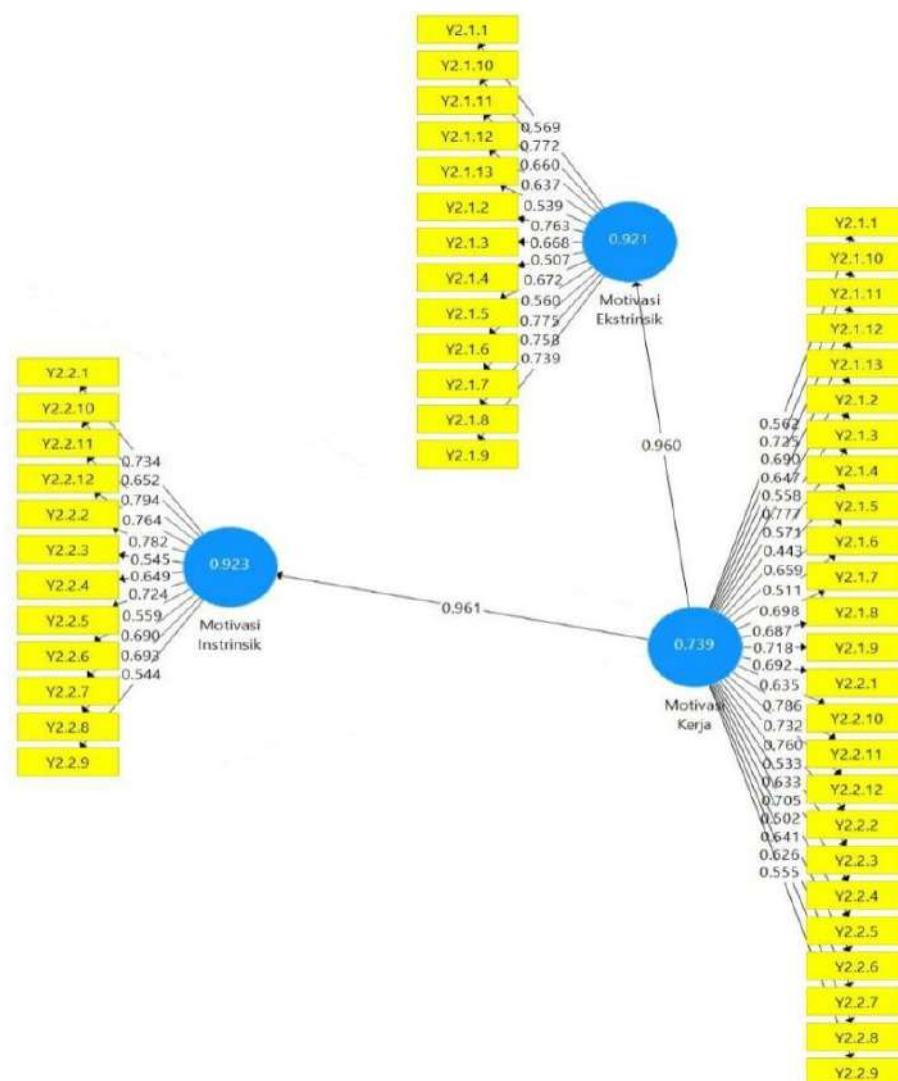


Fig.3: Loading Factors of the Variable Work Motivation

Based on the result of validity test on each construct indicator forming model for the variable work motivation ( $\eta_2$ ), all indicators had loading factor values above 0.5. Therefore, all indicators from the variable work motivation were valid. The result of reliability test on the goodness of fit test of model of the variable work motivation was reliable. It was because the value of both

Cronbach's Alpha and Composite Reliability were above 0.70.

The result of the goodness of fit test of measurement model of the variable apparatus performance ( $\eta_3$ ) can be seen in the reflexive indicator construct testing and Figure (4).

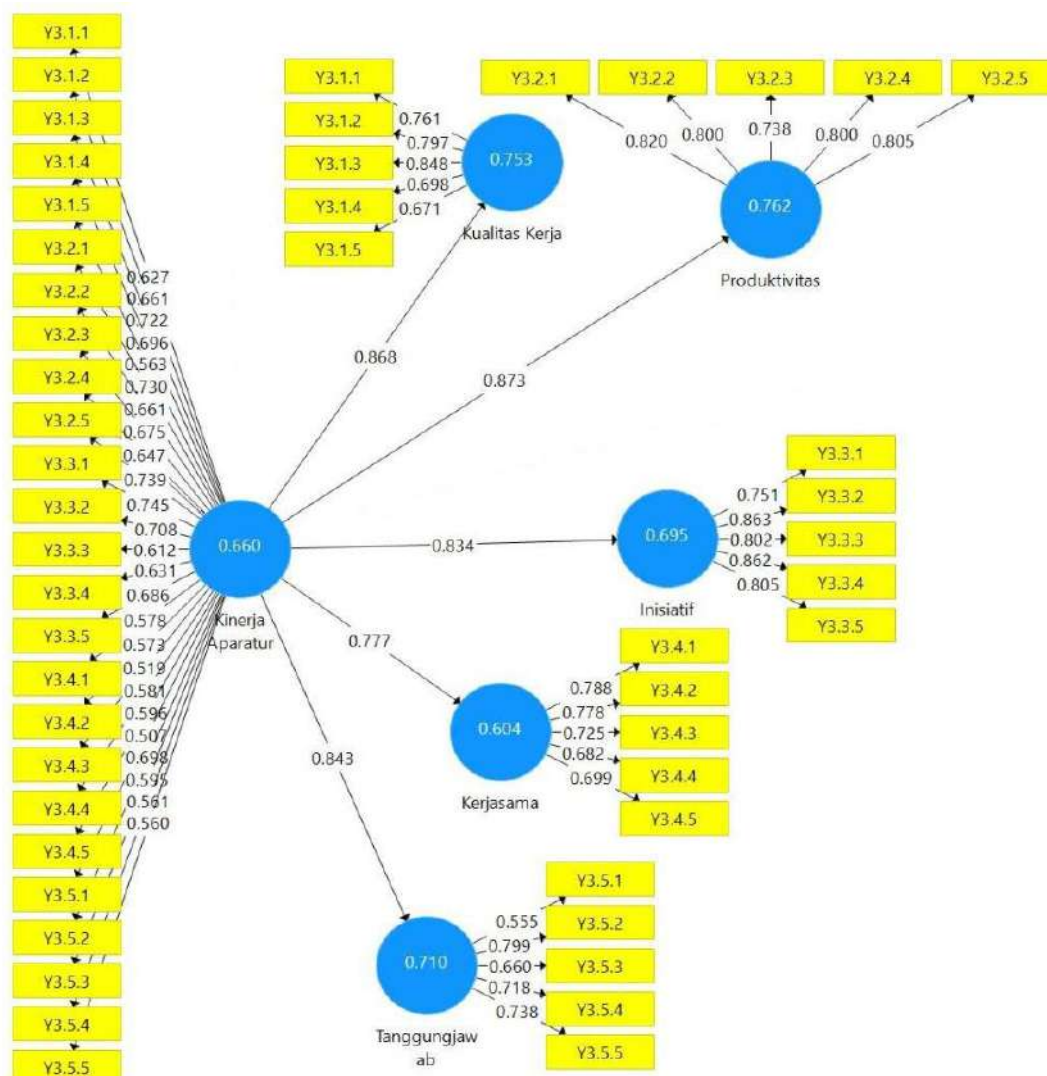


Fig.4: Loading Factors of the Variable Apparatus Performance

Based on the result of validity test on each construct indicator forming model for the variable apparatus performance, of 25 indicators tested, all indicators had loading factor values above 0.5. Therefore, all indicators of the variable apparatus performance were valid. The result of reliability test of the goodness of fit of model showed that each dimension of five dimensions forming model for the variable apparatus performance was reliable. It was because the value of Cronbach's Alpha and Composite Reliability were above 0.70.

## 2. The Effect of Female Leadership Competency on Apparatus Performance in the Government of Gorontalo District

The result of hypothesis testing showed that female leadership competency did not provide significant effect for apparatus performance. This was surely an

antithesis of concept proposed by Growe and Montgomery (1999), Tan (1991) and Stelter (2002). They explained that female leadership competency was equal to male leadership competence due to its special characteristic, feminism that was more effective in improving the performance of its subordinates than leadership competency approach.

The effect of female leadership competency, even though positive, had a low coefficient, which was only 15.4%. The result was in contrast with the result of research performed by Simatupang (2017). He found that female leadership style, which was Androgyny style; a combination of feminism and masculine side that tended to be feminist, had a significant effect on the performance of bureaucratic apparatus in the Government Office of North Sumatera with a coefficient of 72.2%. It was supported by Puspitasari and Oktarina (2018) showing that leadership

style had a significant effect on the apparatus performance with a coefficient of 53.3%.

According to the interview result, insignificant result was relevant to female leadership competency that was yet fully implemented in the government Gorontalo District. This condition was inseparable from the low actualization of typical female leadership style (Androgyny Leadership) by female superiors, either structural officials of echelon II, III or IV.

The low actualization of androgyny leadership style showed that women leaders did not use their feminist ability optimally. Instead, they tended to apply the masculine style owned by men. Bem (1981) expressed that the nature of androgyny was confirmed in an individual when s/he had two characteristics, masculinity and femininity. The androgyny leadership style was considered important because a leader should have not only a high social sensitivity but also determination and consistency in implementing policy in the right target. Likewise, Partini (2013) stated that androgyny was individuals having two characteristics at the same time, which were masculinity and femininity in equal. For example, when making argumentation, leaders should not only be determined and dominant, but also be loving, sociable, kind and close to the citizens.

In term of motivation aspect, the presence of the concept of androgyny female leadership could explain how androgyny leadership concept affected the apparatus motivation to have a high performance. It was in line with Hasibuan (2003:141) that motivation had an important role encouraging and driving employees to work for specified goals. If work motivation was low, the specified goal would not be achieved. Therefore, androgyny leadership concept was needed to generate work motivation for each apparatus for effectiveness of female leadership competency, especially apparatuses in the government of Gorontalo District.

### 3. The Effect of Female Leadership Competency on Organizational Culture

The result of hypothesis testing on the effect of female leadership competency on organizational culture showed that female leadership competency provided positive significant effects for organizational culture. The coefficient value was quite high, which was 89.2%. This showed that female leadership competency was a determinant of organizational culture.

The result of this research was consistent with the result of research performed by Riadi (2018). It showed

that female leadership competency had a significant effect and was positively correlated with organizational culture in Cimahi. It was also supported by research conducted by Abdussamad, Akib and Paramata (2015) on the significant effect of transformational leadership on organizational culture. The consistency of this research with previous research indicated that organizational culture in the government of Gorontalo District could be improved through female leadership competency. This result was also reinforced by Surjadi (2009). He mentioned that a strong culture was supported by some factors leadership, sense of direction, climate, positive teamwork, value add systems, enabling structure, appropriate competences and developed individual. Of all supporting factors, leadership was a factor having the most dominant effect on the process of culture implementation in an organization, especially in the top leader of the organization. Therefore, the role of leadership competency was seen, especially female leadership competency in establishing an organizational culture that was conducive in working environment.

Based on the interview result, female leadership competency provided a significant effect for organizational culture. The effect was due to innovation ability of female officials as a form of implementation of female leadership competency. This result did not only convey the role of innovation in the improvement of organizational culture in the government of Gorontalo District, but also supported Robbins (2002:248) suggesting seven leadership characteristics to improve organizational culture, one of which was innovator.

This interview result was in line with the result of descriptive analysis on respondents' responses to questionnaires. Of 25 indicators of the variable organizational culture stated in questionnaires, the indicator "Employees were motivated to think creatively" had the highest value 91. It indicated that most respondents agreed that female leadership competency was effective in encouraging apparatus' creativity. Besides, the highest value indicated that innovation ability of female officials was determined by their ability to encourage organization members to think creatively in finding better, more effective and efficient methods, especially while making innovative and new breakthrough to overcome each problem in the work unit.

The finding of this research confirmed opinions of some experts, such as Widodo (2002: 56), that in order to establish organizational culture, government ability and competency of apparatus leadership should be in line with vision, mission and purpose of the organization. This concept emphasized the importance of female leadership

competency in improving organizational culture in government organization, especially in the government of Gorontalo District.

#### 4. The Effect of Female Leadership Competency on Work Motivation

The result of hypothesis testing showed that female leadership competency provided significant effect for work motivation. This significant effect was in line with the result of research on "The Effect of Leadership on Employee Work Motivation in Regional Drinking Water Company (PDAM) Madiun" performed by Ningsih (2016). The finding showed that leadership provided significant effect for employee work motivation in Regional Drinking Water Company (PDAM) Madiun with the coefficient of leadership determination on work motivation 85.9%. It was consistent with the finding of research performed by Pranata (2015) that apparatus performance provided a significant effect for work motivation with the coefficient of determination of 77.5%. This was also consistent with the finding of research performed by Setyawan and Bagus (2014) that the quality of leadership provided a significant effect for work motivation with the coefficient of determination of 52.3%.

The consistency of this research with the previous research confirmed the opinion of some experts, such as Rondinelli (1998) and Morgan and Piercy (1998). They proposed that one of the main factors to improve work motivation was leadership competence. It supported the Sedarmayanti (2010: 185) idea regarding leadership concept for women. She revealed that to improve subordinates' productivity and performance, the leader should have an ability in generating motivation to subordinates and in focusing on behavior to help transformation between individual and organization.

As described in the interview result, the significant effect of female leadership competency on work motivation was given by granting inspirational motivation to the leader herself, impacting the improvement of work motivation. This finding of this research also confirmed Bass (1985) opinion. He stated that the role of female leadership competency in the form of inspirational motivation or compliment did not only served as reward, or even a recognition or motivation for members, but also encountered obstacles in work.

This was also in line with the result of descriptive analysis on respondents' responses to questionnaires. Based on the indicator analysis of respondent's response to question items, work motivation of apparatus in the government of Gorontalo District was affected by female

leadership competency that tended to be transactional where the leader had an ability to grant inspirational motivation. This result was consistent with Schermerhorn (1999) that women leaders tended to be democratic, respectful, concerned to their employees/subordinates and willing to share power and feeling with others.

Findings of this research confirmed the opinion of some experts, such as Buhler (2004:191) stating the importance of motivation. According to him, basically motivation was a process determining how many efforts should be made to carry out the work. Motivation in the form of encouragement to work played a crucial role to achieve goals, so each organization/company should be able to generate strong work motivation for employees.

#### 5. The Effect of Organizational Culture on Apparatus performance

Based on the result of hypothesis testing, organizational culture did not provide significant effect for apparatus performance. Even though the order of organization culture was positive, the coefficient value was low (36.9%). This result was in line with a research performed by Gani (2006), who found that organizational culture did not provide significant effect for the performance of employees in wood processing industry in Makassar. It was also supported by research performed by Susanto and Aisiyah (2010). They stated that organizational culture did not provide significant effect for apparatus performance in Land Office of Kebumen District. In contrast, there was a different result of research performed by Abdullah (2006). He showed that organizational culture provided a positive significant effect on apparatus performance in the Tax Office of West Semarang. Even though there were similar and different results between this research and other research due to different methods, environments and number of research respondents, the result of this research showed that organizational culture did not contribute to the improvement of apparatus performance in the government of Gorontalo District.

Based on the interview result, there was a correlation between the insignificant result and organizational culture that was not fully internalized in the government of Gorontalo District. This condition was inseparable from the low commitment of almost all elements in the government of Gorontalo District; such as structural officials, functional officials or implementation staff. The lack of commitment was in line with the result of descriptive analysis on respondents' responses to the research questionnaires from the variable organizational item. The value of question items "Organization was

consistent in carrying out a plan” was low. The low value showed that organization presented by structural officials, functional officials, and staff was considered lacking commitment in the value of organizational culture internalization. Consequently, apparatus behavior and attitude tended to be passive during the internalization process. The internalization effort was only carried out to fulfill the responsibility in the implementation report and not oriented to the actual internalization efforts, so that the effect was not optimum.

This aspect, confirmed by Wahab (2016) explained that personality and characteristic; such as commitment, honesty and democracy determined the optimization and effectiveness of culture value internalization in an organization. It was supported by Hasibuan (2003:141) that commitment played an important role in encouraging and driving employees to achieve specified goals. If the work motivation was low, the specified goal could not be achieved. For this reason, a commitment was needed to internalize organizational culture values in the government of Gorontalo District.

## 6. The Effect of Work Motivation on Apparatus performance

The result of hypothesis testing showed that work motivation did not provide significant effect for apparatus performance. Coefficient value of this variable was 32.4%. It meant that apparatus performance in the government of Gorontalo District was partly affected by work motivation; while the rest was affected by other factors.

The result of this research was different from the result of research performed by Hanafi (2017) on “The Effect of Work Motivation on Employee Performance in PT. BNI Life Insurance”. He found that motivation provided a significant effect and was positively correlated with the employee performance in PT BNI Life Insurance. It was the same as the result of research performed by Dharmayati (2015) on the Effect of Intrinsic and Extrinsic Motivations on Employee Performance. She found that intrinsic and extrinsic motivations provided a significant effect for employee performance. The different result between this research and the previous research indicated that apparatus performance in the government of Gorontalo District was partly improved by granting work motivation. This result surely became the antithesis of the concept of work motivation based on Herzberg theory in Luthans (2006: 282). He stated that work motivation was an encouragement and good will coming from within (intrinsic) or outside (extrinsic) employees. Based on this

theory, work motivation should affect apparatus performance, yet this research found different result.

The insignificant effect of work motivation on apparatus performance was caused by work demotivation as a result of dissatisfaction felt by apparatus. It was proven by the test result on work motivation that was not significant. Furthermore, the result was also supported by result of interview. We found that work motivation did not fully affect apparatus performance in the government of Gorontalo District due to demotivation in apparatus. Meanwhile, motivation that had been built was not maintained by organization. This was consistent with Winardi (2007:132) that to make an effective organization, the organization should deal with motivational problems. It could stimulate decisions to engage with related organization and to produce at work.

This result was also consistent with the result of descriptive analysis of respondents’ responses to question items having the lowest score, where there were four question items having the lowest score from respondents, such as: (1) Salary included allowances received satisfied the need of employees; (2) Income received by employees was always full without any deduction for organization interest; (3) Organization carried out selection of standing employee; and (4) Award given to employees by organization based on the level of work. Based on the first and second question items above, it indicated that most of respondents considered motivation maintenance effort taken was poor, especially the fulfillment of financial need from apparatus. This condition caused demotivation among apparatus. The implication was apparatus tried to find side job to fulfill their financial needs and often neglected their main tasks because they more focused on the job side. As a result, the effect of work motivation on the apparatus performance was not optimal.

## 7. The Effect of Female Leadership Competency on Apparatus Performance Mediated by Organizational Culture

The result of hypothesis testing on the effect of female leadership competency on apparatus performance mediated by organizational culture significantly provided a positive effect and had a high coefficient value. This testing result was different from the result of previous testing on the direct effect of female leadership competency on apparatus performance that was not mediated by organizational culture. The previous testing resulted an insignificant effect and low coefficient value.

This result supported Jusi in Surjadi (2009) that a strong culture was supported by several factors; such as

leadership, sense of direction, climate, positive teamwork, value add systems, enabling structure, appropriate competences and developed individual. Of all supporting factors, leadership was the factor having the most dominant effect on the process of culture implementation in an organization. Therefore, the role of leadership competence was seen, especially female leadership competency, in establishing a conducive organizational culture.

The significant effect of female leadership competency on apparatus performance mediated by organization culture was caused by the implementation of female leadership competency. The competency was more effective because supported by a high level of organizational culture. The finding was supported by the interview result that the significant effect of female leadership competency on apparatus performance mediated by organization culture was intervened by not only innovation skill, but also a strong commitment to implement it. Consequently, female leadership competency had a role not only as a determinant in organizational culture, but also as indirect determinant in apparatus performance. Female leaders were able to support organizational culture and improve apparatus performance.

Meanwhile, the role of mediation played by organizational culture as a catalyst maximizing the effect of female leadership competency on apparatus performance could be seen from the result of SmartPLS 3.1 analysis through a specific indirect effect test. The analysis result showed that of seven dimensions of organizational culture, there were two having the highest coefficient values i.e. innovation and taking risk. It meant that these dimensions were catalysts maximizing the effect of female leadership competency on apparatus performance.

The role of dimensions innovation and taking risk was triggered by the role of female leadership competency variable in encouraging the staff to do innovation and to improve apparatus performance with creative ideas. This role was called (2016:7) a role of agent of change by Suryanto. The leader encouraged apparatus to do a creative process and to make breakthrough in order to achieve expected ideal condition (service).

The discussion showed two important roles of each variable: the role of female leadership competency in improving organizational culture and the role of organizational culture in improving apparatus performance. However, a strong commitment was required to make the role of female leadership competency effective to provide a significant effect for apparatus performance mediated by organizational culture. The role of organizational culture in

improving the apparatus performance was greatly determined by the role of commitment to implement it.

## 8. The Effect of Female Leadership Competency on Apparatus performance Mediated by Work Motivation

The result of hypothesis testing on the effect of female leadership competency on apparatus performance mediated by work motivation showed positive and significant effects with a high coefficient value. This test result was different from the previous research result on the direct effect of female leadership competency on apparatus performance that was not mediated by work motivation. The result was not significant and the coefficient value was low.

The significant effect of female leadership competency on apparatus performance mediated by work motivation was caused by the more effective role of female leadership competency. The competency was supported by the factor inspirational motivation from work motivation. The finding was supported by the interview result that the significant effect of female leadership competency on apparatus performance mediated by work motivation was not only intervened by female leadership competency, especially ability to generate inspirational motivation, but also caused by the increase in work motivation, so the apparatus performance was also improved. Consequently, female leadership competency had a role as not only determinant in work motivation, but also indirect determinant in apparatus performance through their abilities in supporting work motivation to improve the performance.

Meanwhile, the role of mediation played by work motivation as a catalyst maximizing the effect of female leadership competency on apparatus performance was stated by Herzberg in Luthans (2006:282) in his two-factor theory. He stated that when the competency was implemented in an organization, this theory emphasized the importance of creating balance between the two factors. If one of which was not met, it would lead to ineffective and inefficient work.

The discussion showed that there were two important roles of each variable, i.e. the role of female leadership competency in improving work motivation and the role of work motivation in improving the apparatus performance. Therefore, the finding supported the idea that female leadership competency provided a significant effect for apparatus performance mediated by work motivation.

In consequent, apparatus performance in the government of Gorontalo District was likely to be improved through a strategic role by a female leader in encouraging the role of her leadership competency. Finally, apparatus performance could be improved.

## 9. The Development of Theory about the Effects of Female Leadership Competency, Organizational Culture and Work Motivation on Apparatus Performance

Based on the previous discussion, important factors could be found in this research. Those factors were (1) the balance between masculinity and femininity (androgyny leadership); (2) integrity and persistence and (3) loving others, protecting without any intention and maintaining good relationship. However, in their implementation, those factors could not be implemented partially, but simultaneously with female leadership competency, organizational culture and work motivation to improve apparatus performance. In consequent, geometrically, the framework of simultaneous model of those factors could be described as follows:

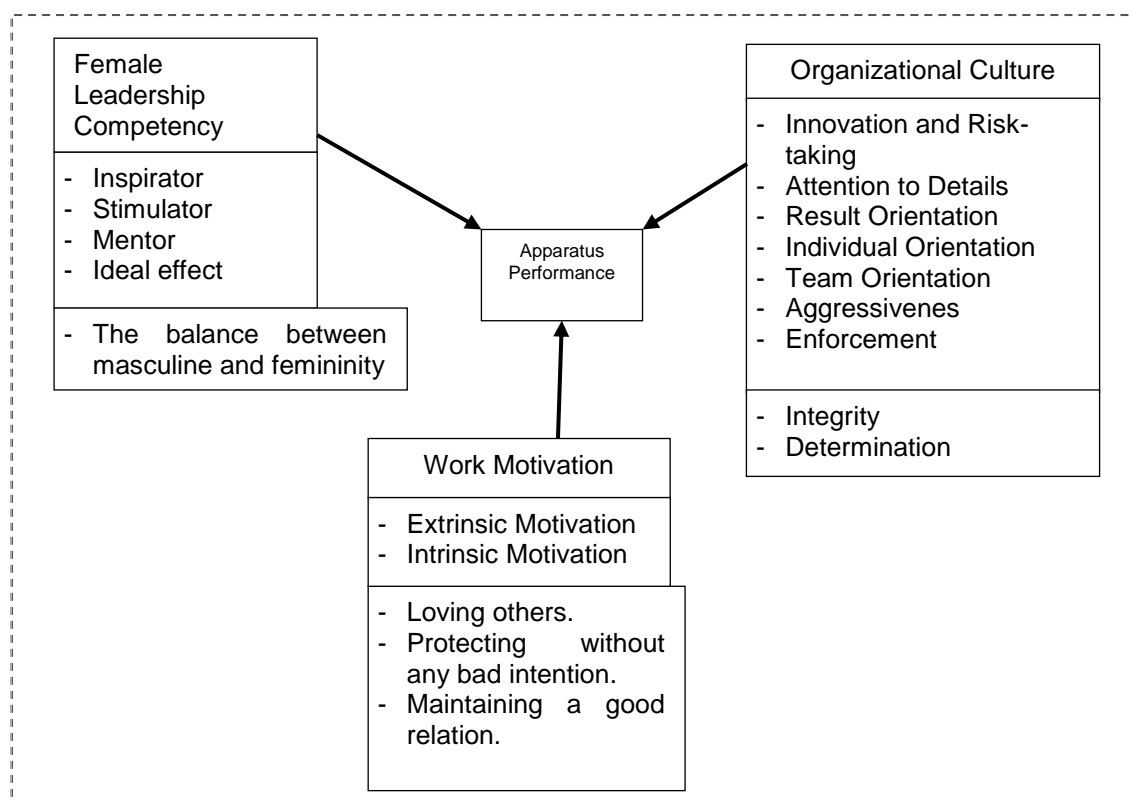


Fig.5: Framework of Simultaneous Model Based on the Research Finding

The framework of model in Figure (5) showed that in order to improve apparatus performance, a simultaneous model concept, an additional function of female leadership competency, organizational culture and work motivation that had been integrated with the findings of the research i.e. the balance between masculinity and

femininity (androgyny leadership), integrity and persistence and loving others, protecting without any intention and maintaining good relationship was proposed. Consequently, in order to implement the model as a model concept, we should formulate a new model concept called Simultaneous Model Concept as described in Table (1).

Table.1: Proposed Simultaneous Model Concept

Research Variable	Research Findings	Proposed Simultaneous Model Concept
<b>Female Leadership Competency</b> <ul style="list-style-type: none"> <li>- Inspirator</li> <li>- Stimulator</li> <li>- Mentor</li> <li>- Ideal effect</li> </ul>	<ul style="list-style-type: none"> <li>- Balance between masculine and femininity</li> </ul>	<b>Female Leadership Competency</b> <ul style="list-style-type: none"> <li>- Inspirator</li> <li>- Stimulator</li> <li>- Mentor</li> <li>- Ideal effect</li> <li>- Balance between masculine and femininity</li> </ul>
<b>Organizational Culture</b> <ul style="list-style-type: none"> <li>- Innovation and Risk-taking</li> <li>- Attention to Details</li> <li>- Result Orientation</li> <li>- Individual Orientation</li> <li>- Team Orientation</li> <li>- Aggressiveness</li> <li>- Enforcement</li> </ul>	<ul style="list-style-type: none"> <li>- Integrity</li> <li>- Determination</li> </ul>	<b>Organizational Culture</b> <ul style="list-style-type: none"> <li>- Innovation and Risk-taking</li> <li>- Attention to Details</li> <li>- Result Orientation</li> <li>- Individual Orientation</li> <li>- Team Orientation</li> <li>- Aggressiveness</li> <li>- Enforcement</li> <li>- Integrity</li> <li>- Determination</li> </ul>
<b>Work Motivation</b> <ul style="list-style-type: none"> <li>- Extrinsic Motivation</li> <li>- Intrinsic Motivation</li> </ul>	<ul style="list-style-type: none"> <li>- Loving others.</li> <li>- Protecting without any bad intention.</li> <li>- Maintaining a good relation.</li> </ul>	<b>Work Motivation</b> <ul style="list-style-type: none"> <li>- Extrinsic Motivation</li> <li>- Intrinsic Motivation</li> <li>- Loving others.</li> <li>- Protecting without any bad intention.</li> <li>- Maintaining a good relation.</li> </ul>

Source: Processed data, 2019

Based on the proposed model, we offered a model concept called a simultaneous model concept as an effort to obtain an effective model to improve apparatus performance. The improvement of apparatus performance was affected by three factors that had been integrated in this model i.e. female leadership competency, organizational culture and work motivation. However, in its implementation, those factors could not be implemented partially. Therefore, it was important to implement those three factors simultaneously. When those factors were implemented simultaneously, the goal of the development of this simultaneous model concept could be achieved. The goal was the improvement of apparatus performance as a result of acculturation from those three factors. As a result, a dynamic condition covering the weakness of each factor

as a joint strength could be manifested, affecting the improvement of apparatus performance.

#### IV. CONCLUSIONS

Data analysis performed found that the three variables, which were female leadership competency, organizational culture and work motivation did not provide a significant effect directly for the performance of government apparatus. However, on the other side, female leadership competency provided an indirectly significant effect for apparatus performance mediated by organizational culture and work motivation.

The increase in effectiveness of female leadership competency, organizational culture and work motivation in improving the performance of government apparatus could

be carried out in various ways, such as encouraging women leader to take part in leadership competence development, making a joint commitment in implementing organizational culture values in the government of Gorontalo District and performing a motivation maintenance program (maintenance factor) for apparatus in the government of Gorontalo District.

## REFERENCES

- [1] Abdullah. (2006). *Pengaruh Budaya Organisasi, Locus Of Control, dan Kepuasan Kerja Terhadap Kinerja Karyawan Pada Kantor Pelayanan Pajak Semarang Barat*. Semarang: Tesis Program Studi Magister Manajemen Universitas Diponegoro.
- [2] Abdussamad, J., Akib, H., & Paramata, J. (2015). *Effect of Transformational Leadership And Organizational Culture on Employee Performance Toward The Department of Education, Youth and Sports Gorontalo Province, Indonesia*. International Journal of Academic Research, 7(1).
- [3] Ahmed, I., Nawaz, M. M., Iqbal, N., & Usman, A. (2010). *Effects of Motivational Factors on Employees Job Satisfaction a Case Study of University of the Punjab, Pakistan*. International Journal of Business and Management, Vol.5(No.3), pg: 70-80.
- [4] Alwi, H. (2007). *Kamus Besar Bahasa Indonesia*. Jakarta: Balai Pustaka.
- [5] Bass, Bernard M. (1985). *Leadership Performance and Beyond Expectations*. New York: The F Press.
- [6] Bem, Lipsitz. Sandra. (1981). *Gender Schema Theory: A Cognitive Account of Sex Typing*. Psychological Review Journal. Vol. 88, No. 4, 1981. P.354-364.
- [7] Buhler, P. (2004). *Alpa Teach Yourself. Management Skills dalam 24 Jam*. (Terjemahan). Jakarta: Prenada Media.
- [8] Caroline H, L. (2007). *Transactional, Transformational, transcendent leadership: motivation effectiveness dan measurement of transcendent leadership, leading the future of the public sector*. Delaware, USA: Translantic Dialogue University Of Delaware.
- [9] Dharmayati, Siwi Agustina. (2015). *Pengaruh Motivasi Intrinsik Dan Ekstrinsik Terhadap Kinerja Karyawan Dengan Kepuasan Kerja Sebagai Variabel Intervening Di Badan Pusat Statistik Provinsi Daerah Istimewa Yogyakarta*. Jurnal Manajemen Bisnis UMY Vol. 6 No.2 (2015) p. 429-450
- [10] Djumino, A. M. W. (2010). *Analisis Kepemimpinan dan Motivasi terhadap Kinerja Pegawai pada Kantor Kesatuan Bangsa dan Perlindungan Masyarakat di Kabupaten Wonogiri*. Surakarta: UMS.
- [11] Dwiyanto, A. (2006). *Mewujudkan Good Governance Melalui Pelayanan Publik*. Yogyakarta: Gadjah Mada University Press.
- [12] Ghazali, I., & Latan, H. (2015). *Konsep, Teknik, Aplikasi Menggunakan Smart PLS 3.0 Untuk Penelitian Empiris*. Semarang: BP Undip.
- [13] Growe, R., & Montgomery, P. (1999). *Women and The Leadership Paradigm: Bridging The Gender Gap*. Lafayette-Louisiana: University of Louisiana.
- [14] Hanafi, Bayu Dwilaksono. (2017). *Pengaruh Motivasi, Dan Lingkungan Kerja, Terhadap Kinerja Karyawan, Dengan Kepuasan Kerja Sebagai Variabel Mediasi Pada Pt Bni Lifeinsurance*. Jurnal Pendidikan Ekonomi dan Bisnis UNJ Vol.5 No.1 Tahun 2017 p. 73-89
- [15] Hasibuan, Malayu S.P. (2003). *Manajemen Sumber Daya Manusia*, Edisi Revisi, Jakarta: Bumi Aksara.
- [16] Hatch, M. J. (1997). *Organization Theory: Modern, Symbolic, and Postmodern Perspectives*. Oxford, USA: Oxford University Press.
- [17] Kusriyanto, B. (1991). *Meningkatkan Produktivitas Karyawan*. Jakarta: PT. Pustaka Binaman Pressindo.
- [18] Luthans, F. (2006). *Perilaku Organisasi*. Yogyakarta: Andi.
- [19] Mitchel, T. R., & Larson. (1987). *People and Organization; An Introduction to Organizational Behavior*. Singapore: Mc. Graw Hill Inc.
- [20] Moenir. (2002). *Manajemen Pelayanan Publik*. Jakarta: Bina Aksara.
- [21] Morgan, Neil, and Piercy, Nigel. F. (1998). *Customer Satisfaction Measurement and Management: A Processua Analysis*. Journal of Marketing Management, Vol.11, p.817-834
- [22] Mulyadi, M. (2016). *Metode Penelitian Praktis, Kuantitatif dan Kualitatif*. Jakarta: Publica Press.
- [23] Ningsih, A. Reknowati. (2016). *Pengaruh Kepemimpinan Terhadap Motivasi Kerja Karyawan Pada PDAM Kota Madiun*. Jurnal Ilmiah Ekonomi dan Pembelajarannya. Vol. 4, No. 2 Tahun 2016
- [24] Partini. (2013). *Bias Gender dalam Birokrasi*. Yogyakarta: Tiara Wacana.
- [25] Piercy, N. F., & Morgan, N. A. (2000). *Sources of Effectiveness in Business to Business Sales Organization*. Journal of Personal Selling and Sales Management, Vol.11(Iss.2), p.13-23.
- [26] Pranata, Fajar Irja. (2015). *Pengaruh Kompetensi Aparatur Pemerintah Terhadap Kualitas Pelayanan Publik Pada Kantor Kecamatan Sangatta Selatan Kabupaten Kutai Timur*. Jurnal Ilmu Sosial Untag 1945 Samarinda Vol.1 No.2 Tahun 2015.
- [27] Puspitasari, M., & Oktarina, N. (2018). *Pengaruh Gaya Kepemimpinan, Budaya Organisasi, dan Tata Ruang Kantor Terhadap Kinerja Pegawai*. Economic Education Analysis Journal, Vol.7(Iss.1), pp.316-328.
- [28] Riadi, F. (2018). *Pengaruh Fungsi Kepemimpinan, Budaya Organisasi Dan Komitmen Organisasi Terhadap Kinerja Pegawai (Survey Pada Badan Pelayanan Perizinan Terpadu Dan Penanaman Modal Kota Cimahi)*. Jurnal Majalah Bisnis Dan IPTEK, Vol.11(Issue No.1), pp.12-24.
- [29] Robbins, S. P. (2002). *Prinsip-prinsip Perilaku Organisasi*. Terjemahan: Halida. Edisi Kelima. Jakarta: Erlangga.
- [30] Robbins, S. P. (2010). *Perilaku Organisasi*. Edisi ke-9. Jilid 2. Jakarta: PT. Elex Komputindo Gramedia.

- [31] Rondinelli, D. (1998). *Privatization, Governance, and Public Management: The Challenges Ahead*. Business and The Contemporary World Journal, Vol.10(No.2), pp.167.
- [32] Schermerhorn, John R. (1999), *Management*, 4th ed., New York: John Wiley & Sons Inc
- [33] Sedarmayanti. (2010). *Sumber Daya Manusia dan Produktivitas Kerja*. Bandung: CV. Mandar Maju.
- [34] Setyawan, Dodi., dan Bagus, Nanang. (2014). *Kualitas Kepemimpinan, Etos Moralitas Pribadi, Kompetensi, dan Pelayanan Publik*. Jurnal Ilmu Administrasi Negara UTT Malang Vol.13 No. 1, Juli 2014.
- [35] Simatupang, L. (2017). *Kepemimpinan Perempuan Dalam Birokrasi (Studi Deskriptif Pada Kantor Pemerintahan Provinsi Sumatera Utara)*. Medan: Universitas Sumatera Utara.
- [36] Stelter, N. Z. (2002). *Gender Differences in Leadership: Current Social Issues and Future Organizational Implications*.
- [37] Surjadi. (2009). *Pengembangan Kinerja Pelayanan Publik*. Bandung: PT. Refika Aditama.
- [38] Suryanto, Adi. (2016). *Sistem Pengembangan Kader Pimpinan ASN: Sebuah Strategi Resolusi Percepatan Reformasi Birokrasi di Indonesia*. Jurnal Pendayagunaan Aparatur Negara Vol.VI Tahun 2016.
- [39] Susanto, H., & Aisiyah, N. (2010). *Analisis Pengaruh Kepemimpinan Dan Budaya Kerja Dengan Motivasi Sebagai Variabel Intervening Terhadap Kinerja Karyawan Di Kantor Pertanahan Kabupaten Kebumen*. MAGISTRA, 22(74), 15-38.
- [40] Tan, M. G. (1991). *Perempuan Indonesia Pemimpin Masa Depan*. Jakarta: Pustaka Sinar Harapan.
- [41] Tjiptono, F. (2002). *Prinsip-Prinsip Total Quality Service*. Yogyakarta: Andi.
- [42] Wahab, ASolichin. (2016). *Analisis Kebijakan: Dari Formulasi Ke Penyusunan Model-Model Implementasi Kebijakan Publik*. Jakarta: Bumi Aksara.
- [43] Widodo, Joko. (2002). *Akuntabilitas dan Kontrol Birokrasi*. Surabaya: Insan Cendekia
- [44] Winardi. (2007). *Perilaku Organisasi*. Bandung: Tarsito.
- [45] Zenger, J. H., & Folkman, J. R. (2009). *The Extraordinary Leader: Turning Good Manager Into Great Leaders*. New York, USA: McGraw Hills.

# Effects of Bureaucratic Behavior, Organizational Culture and Leadership on Public Services in the Local Government of Gorontalo

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**Abstract**— Public services operated by the government agencies in Gorontalo were not in accordance with procedures. People almost were not informed about public services they could obtained. They were also reluctant to complain about the poor services. In fact, public services by government agencies had been regulated in Law of 2007 on The Second Amendment to Regulations Number 3 of 2005 on Duties and Authorities of Regents and Deputy Regents as well as Regional Government Officials in Performing Technical Tasks. The objective of this research was to find effects of bureaucratic behavior, organizational culture, and leadership on public services in the local government of Gorontalo. This research used survey method. Data were collected using several instruments i.e. observation, interview, documentation, questionnaire, and literature review. Validity test was conducted using the value of Standardize Loading Factor (SLF); while reliability test was using the value of Cronbach Alpha (CA). The research findings showed that bureaucratic behavior, organizational culture and leadership simultaneously provided positive effects for public services in the government agencies of Gorontalo.

**Keywords**— *bureaucratic behavior, organizational culture, leadership, public services.*

## I. INTRODUCTION

Today, public services complying with procedures are still unable to meet the public's expectation. Public hardly has any idea of how they access public services in accordance with the standard procedure set out by the government. They are also reluctant to complain about bad services they got, just accepting the modest services willingly. Employees in the service department should provide equal services for all people. Public services are run by an individual or group of people or particular agency to provide assistances and facilities for public. Therefore, it must be operated indiscriminately and equally for all people to achieve particular goals. As a result, professional services can be provided.

Service problems have been normatively set out under the Law Number 25 of 2009 on Public Services and Reagent Regulation Number 4 of 2007 on Second Amendment over Reagent Regulation Number 3 of 2005 on Tasks and Authorities of Regents and Deputy Regents as well as Regional Government Officials in Performing Technical Tasks. Nevertheless, problems of the

government bureaucracy in providing services for public are still unsolved. The problems are is related to not only issues of power relation, but also various negative sigma attaching to the government bureaucracy that still remains as the most concerned problem. Based on the result of assessment of local government compliance with the Law Number 25 of 2009 on Public Services, in 2018, the government of Gorontalo was only able to stay in the yellow zone despite the zone insufficiency. Therefore, the ombudsman of the Republic of Indonesia repeatedly provided policy options for local leaders that were still in the yellow or red zone by giving reprimand and encouraged all leaders in public service units regarding the implementation of standardized public services to.

The issues had made me interested in proving to what extent the bureaucratic behavior, organizational culture, and leadership improved public services. The objective of this research is to find whether or not bureaucratic behavior, organizational culture, and leadership simultaneously affect public services in the government of Gorontalo.

## II. RESEARCH METHOD

The research used survey research method. Information was collected from respondents using questionnaires. Generally, the notion of survey was limited to the notion of sample survey where information was collected from a half of population to represent all population (Singarimbun and effendi, 1982:14). In term of the type of research, it was explanatory research using a quantitative approach. Quantitative approach was performed in the inferential study (to test hypothesis). However, in term of the level of explanation, it was associative research. According to Sugiyono (2002), associative research was research aimed to find the correlation between two or more variables.

The research population was civil servants in ten offices and agencies carrying out public services in the local government of Gorontalo. Samples collected in this research were 98 civil servants selected using proportional random sampling. Meanwhile, the public was only used as supporting samples (second opinion).

### Data Collection Technique

In this research, survey was performed by collecting data from samples. Instruments used in this research were observation, interview, documentation, questionnaires, and literature review. There were two types of data used in this research i.e. primary and secondary data. The primary data were respondents' response to questionnaires we distributed. Meanwhile, the secondary data were documents in the local government of Gorontalo obtained from the literature review.

Data analysis was performed by converting response categories into score and determining the categories Likert scale. According to Sugiyono, (2011:147), the Likert scale was used to measure attitude, opinion, and perception of an individual or a group of people towards social phenomena. The response of each questionnaire was ranged from very positive to very negative.

Table 1. Likert Scale Category

No.	Scale	Criteria
	5	Excellent (SB)
	4	Good (B)
	3	Average (CB)
	2	Adverse (K)
	1	Bad (TB)

### Validity Test

Validity test was performed to find whether or not questions in the questionnaire used as the data collection instrument were valid and able to measure the construct in this research. Validity of the variables with reflective indicators was tested by referring to Standardize Loading Factor (SLF). Igbaria et al. in Wijayanto (2008) suggested that a good SLF score was  $\geq 0.30$ . Hair (2010) suggested SLF score  $\geq 0.5$  showing that convergent validity had been achieved or SLF  $\geq 0.7$ .

### Reliability Test

Reliability test was used to test whether or not respondents' responses on the question were consistent or stable from time to time. The measurement of reliability in this research was performed using one shot method by referring to cronbach alpha score. The questionnaire was considered reliable when respondents' responses to the question were consistent or stable from time to time. In this research, reliability test was performed in the construct indicators that had passed validity test and validated. According to Latan and Temalagi, (2013) a construct or variable was considered reliable when the Cronbach Alpha score was  $> 0.70$ .

### Statistical Data Analysis Technique

Data analysis used to prove the proposed hypothesis was Partial least square-path model (PLS-PM) analysis. According to Yamin(Kurniawan et al., 2011), PLS-PM was data analysis technique used to analyze the correlation between a set of variable blocks.

## III. FINDINGS

### Validity and Reliability Tests for Reflective Indicators

For the reflective construct, several measurement types were used i.e. (1) convergent validity that could be seen from Standardized Loading Factor (SLF); (2) square root of average variance extracted (AVE); (3) Composite Reliability (CR); and (4) Cronbach Alpha (CA). Based on validity and reliability tests of a construct, we found that SLF score of all items in the indicator of public service variable was  $(Y) > 0.5$ . Therefore, correlation between each measurement item (indicators) and the construct was valid. CR score of public service variable was 0.965. If CR  $> 0.8$ , the construct had a high reliability or was reliable. Moreover, if CR was  $> 0.6$ , it was quite reliable ((Yamin and Golesorkhi, 2010). CA score of public service variable was 0.96. If CA was  $\geq 0.5$ , it was good; whereas if it was  $\geq 0.3$ , it was sufficient.

## Statistical Data Analysis

## 1. Structural Model (Inner Model) and Direct Relation (Direct Effect) Testing among Variables

Structural model in PLS was evaluated using path coefficient; while the significance was tested based on the value of t-statistic and p-values of each path.

Table 2. Direct Relation of Path Coefficient, t-Statistic, and p-values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	t-statistics (O/STDEV)	p-values
BO → PEL PUB	0.201	0.197	0.087	2.306	0.022
KEP → PEL PUB	0.518	0.526	0.083	6.224	0
PB → PEL PUB	0.201	0.202	0.084	2.376	0.080

Source: Processed data, 2018

## 2. F Test (Simultaneously Testing)

F test was a test conducted to regression coefficient simultaneously. This test was conducted to find simultaneous effects of all independent variables in the model on dependent variables. F test in this research was used to test significant effects of bureaucracy, organizational culture, and leadership on public services simultaneously.

Table 2 shows that *path coefficient* of organizational culture (BO) on public services (PEL PUB), leadership (KEP) on public services (PEL PUB) and bureaucratic behavior (PB) on public services (PEL PUB) were 0.087, 0.083 and 0.084 respectively. All coefficients were positive, which meant that the direct relation among

variables was directly proportional. Bureaucratic behavior (PB), organizational culture (BO), and leadership (KP) on public services (PEL PU) was 61.512. All coefficients were positive, so they simultaneously provided significant effects for public services.

*T-statistic* value among variables was higher than the value of t-table (1.97). The p-value was below 0.05, so all variables provided significant effects for public services in the local government of Gorontalo.

## 3. Statistical Analysis on Variable Descriptive

In this part, the result of distributed questionnaire processed using SPSS 17 version was explained descriptively. The statistical description was as follows:

Table 3. Description of Bureaucratic Behavior Variable (X1)

No.	Indicator	Item	Frequency (%)					Mean
			1	2	3	4	5	
1.	Work Division (X1.1)	1	0.0	0.0	3.1	52	44.9	4.42
		2	0.0	0.0	3.1	52.0	44.9	4.37
Mean X1.1								4.35
2.	Responsibility (X1.2)	1	0.0	0.0	7.1	49.0	43.9	4.37
		2	0.0	0.0	7.1	49.0	43.9	4.13
Mean X1.2								4.25
3.	Discipline(X1.3)	1	0.0	0.0	7.1	49.0	43.9	4.38
		2	0.0	0.0	7.1	49.0	43.9	4.31
Mean X1.3								4.34
4.	Unity of Command (X1.4)	1	0.0	0.0	14.3	32.7	53.1	4.39
		2	0.0	0.0	15	44.4	39.2	4.21
Mean X1.4								4.30

5.	Unity of Direction (X1.5)	1	0.0	0.0	11.2	46.9	41.8	4.31
		2	0.0	0.0	13.3	56.1	29.6	4.17
Mean X1.5								4.24

Source: Processed data, 2018

Table 3 shows the data of the result of analysis on the indicator of bureaucratic behavior variable (X1). In respect of the work division indicator (X1.1), employee placement according to their training or expertise was more preferable. Employees would have an ability to provide services optimally. For responsibility indicator (X1.2), public expected that while providing services, employees should willingly listen to their complaints. In term of discipline (X1.3), they expected that employees arrived

punctually because they usually had arrived at the office prior to the service hour. For the unity of command indicator (X1.4), the most expected service was that employees should perform their works according to the instruction, or the standard operational services. For the unity of direction indicator (X1.5), employees were expected to work according to the authority given. Their tasks were not supposedly overlapping, because each employee had to work based on his/her authority.

Table 4. Description of Organizational Culture Variable (X2)

No.	Indicator	Item	Frequency (%)					Mean
			1	2	3	4	5	
1.	Involvement (X2.1)	1	0.0	0.0	12.2	31.6	56.1	4.44
		2	0.0	0.0	12.2	31.6	56.1	4.15
Mean X2.1								4.30
2.	Consistency (X2.2)	1	0.0	0.0	14.3	44.9	40.8	4.27
		2	0.0	0.0	14.3	44.9	40.8	4.34
Rerata X2.2								4.31
3.	Adaptation (X2.3)	1	0.0	0.0	16.3	41.8	39.8	4.12
		2	0.0	0.0	16.3	41.8	39.8	4.23
Rerata X2.3								4.18
4.	Mission (X2.4)	1	0.0	0.0	13.3	56.1	29.6	4.14
		2	0.0	0.0	13.3	56.1	29.6	4.31
Mean X2.4								4.23

Source: Processed data, 2018

Table 4 shows the data of the result of analysis on the indicator of organizational culture variable (X2). In term of involvement indicator (X2.1), employee improvement provided a huge contribution. The improvement had to be performed properly and continuously, so employees would feel satisfied and comfortable with their careers. In the consistency indicator (X2.2), the second item provided a

greater contribution, in which the score adopted referred to the essence contained in the organization. In term of adaptation (X2.3), people expected that employees understood their intention and character. In the mission indicator (X2.4), most people expected that employees were able to build an effective team to provide services.

Table 5. Description of Leadership Variable (X3)

No.	Indicator	Item	Frequency (%)					Mean
			1	2	3	4	5	
1.	Interpersonal role(X3.1)	1	0.0	0.0	23.5	45.9	26.3	3.95
		2	0.0	0.0	23.5	45.9	26.3	4.03
Mean X3.1								3.99
2.	Information role(X3.2)	1	0.0	0.0	20.4	53.1	25.5	4.12
		2	0.0	0.0	20.4	53.1	25.5	4.00
Mean X3.2								4.06
3.	Decision role (X3.3)	1	0.0	0.0	17.3	39.8	41.8	4.22
		2	0.0	0.0	17.3	39.8	41.8	4.26
Mean X3.3								4.24

Source: Processed data, 2018

Table 5 shows the data of the result of analysis on the indicator of leadership variable (X3). For interpersonal role indicator (X3.1), face to face interaction between a leader and subordinate while stating an action, existence, and experience provided a greater contribution. In information indicator (X3.2), the first item provided greater

contribution. In providing information, leader should use straightforward words. In decision role indicator (X3.3), the most expected improvement was that while making decision, leader should always carefully consider the potential effects that might appear.

Table 6. Description of Public Services Variable (Y)

No.	Indicator	Item	Frequency (%)					Mean
			1	2	3	4	5	
1.	Transparency (Y1)	1	0.0	0.0	24.5	54.1	18.4	3.88
		2	0.0	0.0	24.5	54.1	18.4	3.99
Mean Y1								3.94
2.	Accountability(Y2)	1	0.0	0.0	24.1	49.0	23.5	3.83
		2	0.0	0.0	24.5	49.0	23.5	3.91
Mean Y2								3.87
3.	Conditional(Y3)	1	0.0	0.0	31.6	52.0	10.2	3.67
		2	0.0	0.0	31.6	52.0	10.2	3.67
Mean Y3								3.67
4.	Participatory(Y4)	1	0.0	0.0	13.6	41.8	22.4	3.82
		2	0.0	0.0	31.8	41.8	22.4	3.81
Mean Y4								3.82
5.	Right to equality (Y5)	1	0.0	0.0	24.5	49.0	23.5	3.99
		2	0.0	0.0	24.5	49.0	23.5	3.89
Mean Y5								3.94
6.	Balanced between right and responsibilities (Y6)	1	0.0	0.0	30.6	41.8	22.4	3.95

		2	0.0	0.0	30.6	41.8	22.4	3.81
Mean Y6								3.88

Source: Processed data, 2018

Table 6 shows the data of the result of analysis on the indicator of public service variable (Y). From transparency indicator (Y1), the first item provided the greatest contribution, in which service systems in each department had already used technology. In accountability indicator (Y2), the second item provided the greatest contribution, in which the existing service systems were expected to comply with the minimal service standards. In term of conditional (Y3), both items provided equal contributions, in which employees were expected to have ability in providing fast services for the community. It was also expected a compatibility between the result of provided services and regulation set out. In participatory indicator

(Y4), most people expected that in term of service provision, there had be compatibility between the service requirement and the service type. In the right to equality indicator (Y5), employees were expected to provide services without discrimination. In the balance indicator (Y6), employees were expected to meet their obligation in providing services to the community properly and according to the procedure.

#### 4. Hypothesis Testing

Hypothesis testing based on the result of processed data using t-test is indicated in Table 7.

Table 7. The Result of Hypothesis Testing

Variable		Path Coefficient		p-value	Description
X	Y	Original Sample	Standard Deviation		
PB (X1)	PEL PUB	0.201	2.376	0.018	Positive significant
BO (X2)	PEL PUB	0.201	2.306	0.022	Positive significant
KEP (X3)	PEL PUB	0.518	6.224	0	Positive significant

The test result showing bureaucratic behavior, organizational culture, and leadership simultaneously affecting public services in the local government of Gorontalo was presented in table 8.

Table 8. The Result of Simultaneous Regression Coefficient Test (F Test)

#### ANOVA<sup>b</sup>

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	4017.642	3	1339.214	61.512	.000 <sup>a</sup>
Residual	2046.532	94	21.772		
Total	6064.173	97			

a. Predictors: (Constant), X3, X2, X1

b. Dependent Variable: X4

Based on Table 8, the value of  $F_{\text{count}}$  was 61.512 with the value of sig 0.00. The value of  $F_{\text{count}}$  was higher than  $F_{\text{table}}$  and the value of sig was lower than 0.05. Therefore,  $H_0$

was rejected and  $H_a$  was accepted. It meant that bureaucratic behavior, organizational culture, and

leadership simultaneously provided significant effects for public services in the local government of Gorontalo.

#### IV. DISCUSSION

##### The Effect of Bureaucratic Behavior on Public Services

The result of hypothesis testing showed that bureaucratic behavior provided positive and significant effects for public services in the local government of Gorontalo (coefficient value of 2.376 and  $p$ -value of 0.018). It meant that the better bureaucratic behavior, the better services provided by the government agencies for public.

Data in Table 3 show the result of description of variable with five types of indicators i.e. working division, responsibility, discipline, unity of command, and unity of direction.

##### 1. Working Division

Based on the result of interview, it was necessary for the local government of Gorontalo to pay attention to the placement of the head of department and employees. Scientific background was needed in addition to the academic achievement for employee placement because neglected scientific background could be an obstacle when employees did not know their works. Employees could not focus on their work. When people went to the service center for administration and needed explanation related to the administration procedure, they could not give any proper explanation. This case supported theory proposed by Fayol (2013) that working division had to be specialized or divided into smaller elements, so the working outcome and effectiveness of employees would improve along with the improvement of their ability and expertise on the work they carried out.

##### 2. Responsibility

Table 3 shows that in term of responsibility, while providing services, employees were not good enough because they could not make response to public's complaints properly. When public needed information, a sense of responsibility to establish communication related to the service procedure could not be delivered properly by the employees. Therefore, people who needed service was not satisfied with the service. They thought that the employees were reluctant to establish communication with them, so their complaint could not be responded well.

##### 3. Discipline

The analysis result showed that employees were expected to be able to come to the office punctually. Local government of Gorontalo was expected to emphasize

discipline enforcement to employees because it was related to their responsibilities as civil servants who were required to be ready to provide services to the public. The public often complained about employees' discipline. Services that had to be provided in the morning and at the predetermined time were often given late. Even there were also other service counters that had yet provided services. Likewise at noon, when services should have been started, people still needed time to wait the employees in the service counter.

##### 4. Unity of Command

The questionnaire result showed that the statement of "doing the work according to instructions" had a high frequency score. Therefore, it was necessary for the local government of Gorontalo to remind their staff continuously. They were required to do their works based on the standard services regulated in Law No. 25 of 2009, not based on their own desire. The understanding of public services should be continuously maintained and evaluated. The local government should check whether their staff had already performed the work according to their work field or only based on their desires. As a result, there would be no complain from the people. However, in fact, the standard had not been met.

##### 5. Unity of Direction

The questionnaire result showed that the statement of "doing the work according to the authority" had a higher frequency score. It meant that each employee had to perform the work based on the agreement, not based on their desire. Therefore, it required evaluation and control from the leader. The leader should issue official instructions for employees to ensure the working procedures was in accordance with the service standard. Instructions from the leader to subordinate had to be in accordance with the procedure because when there was no instruction, there would be two instructions in one work and the service could not be provided optimally to the people. It was in line with the 14 principles of management according to Fayol (2013) on authorities and responsibilities between leader and subordinate; authorities should be equal with responsibilities.

##### The Effect of Organizational Culture on Public Services

The result of hypothesis testing showed that organizational culture provided positive and significant effects for public services in the local government of Gorontalo with a coefficient value of 2.306 and  $p$ -value of 0.022.

Data in Table 4 shows the result of description of variable with four types of indicators i.e. involvement, consistency, adaptation, and mission.

### 1. Involvement

The questionnaire result showed that the statement “prepared and sustainable employee improvement” had a higher frequency score. Therefore, it was important for the local government of Gorontalo to pay attention to the improvement of their employees. They should make a plan for prepared and sustainable employee improvement. Employees had right to improve. They should be given opportunity to make improvement. To make a fair and equitable employee improvement, employee improvement program was made carefully based on scientific methods rooted in skill and education needed by agencies relevant to the job needed. The improvement was for both non-career and career objectives for junior or senior employees and conducted through training and further studies. The employee improvement was an activity required to be performed by the local government of Gorontalo. It would broaden and enhance employees’ knowledge, ability, and skill suitable with the demand of their job. It was in line with a theory proposed by Pratt, L. and Denison, D (2000:168). It argued that involvement was the key factor in organizational culture. Active involvement from organizational members affected organizational performance, particularly management, strategy, organizational strategy, organizational structure, transaction costs, and so on.

### 2. Consistency

Table 4 shows that the statement “organizational identity externally had a connection with organizational image” provided a higher frequency score. Therefore, it was important for local government to pay attention to employees who did not comply with values and rules. In term of service, work overlapping often happened. Job desks of some employees were unclear. For example, one day, a letter delivered by a customer was received by an employee. On the next day, when the employee wanted to check the letter, he/she forgot where he/she put the letter. It happened because the employee worked in two divisions, administration and service divisions at the same time. People assumed that this would slow down the service process they obtained.

### 3. Adaptation

The result of analysis result on adaptation indicator showed that the statement “understanding people character” had a higher frequency score. It indicated that people were asking the service procedure operated by the local government of Gorontalo moved into technological

era. To respond to this challenge, every OPD leader had to be aware of this era development known as distribution. Government should try to transform the public service system into machine. The enforcement would force public sector to cut off the bureaucratic chains for the government performance. When public sector was able to manifest this threat, the government would be able to improve their public services. When quality of public service increased, people’s trust in government would be restored.

### 4. Mission

The questionnaire result showed that the statement “prioritizing public interest” provided a higher frequency score. It was important for the local government of Gorontalo to place public as government partner, so the government was able to make an interpretation on a source based on information presented by the source. While providing services, every agency should presented their service standard so that the public as the recipient of the service understood it properly. The standard had to be well socialized by each employee working in providing services for people. Therefore, information delivered by the employee met the service standard known by people.

### The Effect of Leadership on Public Services

The result of hypothesis testing showed that leadership provided positive and significant effects for public services in the local government of Gorontalo with standard deviation of .244 and *p-value* of 0.

Table 5 shows the result of description of variable with three types of indicators i.e. interpersonal role, information role, and decision role.

### 1. Interpersonal Role

The questionnaire result showed that the statement “in delivering much kind information, the leader must do it face to face to establish a good open communication” provided a higher frequency score. It meant that communication between a leader and subordinate was not good enough. It was necessary for each leader in each agency of local government of Gorontalo to understand that communication was one of the important factors for people in daily life both individually and in group or organization. It was also important for each agency to be able to cover the gap between a leader and subordinate (employee), employee and people as the public to establish a better relationship, especially in public services. It was in line with the theory of interpersonal relation needs proposed by Li, Lee and Lai (2009) that each human had three interpersonal needs which were control, inclusive and affection. The fundamental of this theory was that human needed other

people as social beings. This theory explained that the relation among individuals should present something in a particular condition to create something satisfying the needs of interpersonal relation.

## 2. Information Role

The result of analysis on information role showed that the statement “leader delivered information with straightforward words” had a higher frequency score. It showed that leaders in the government environment of Gorontalo had to understand that one of the characteristics of a good leader was being able to communicate with the subordinate well. Effective communication ability for a leader was absolute. A leader should be able to give a right direction to subordinates, to engender work enthusiasm for subordinates and to make right evaluation of subordinate performance.

## 3. Decision Role

The questionnaire result showed that the statement “appreciating and respecting subordinates’ opinion and being kind, not discriminating” had a higher frequency score. It was important for leaders in the government agency of Gorontalo to understand that one of the functions to achieve the goal required to be performed by leaders was how the leader could make decision by carefully considering both potential positive and negative impacts. In the reality of decision making, the head of department and agency in the local government of Gorontalo tended to use their own leadership styles, either in autocratic or paternalistic style. It caused internal conflicts affecting employees’ performance and impacted service provisi for public. It was in line with a theory proposed by Rasoolimanesh *et al.* (2016). In making decision, one had to choose the best among available various alternatives.

## The Effect of Bureaucratic Behavior, Organizational Culture and Leadership on Public Services

The result of hypothesis testing showed that public services were strongly affected by bureaucratic behavior, organizational culture and leadership variables.

Table 6 shows the result of description of variable with six types of indicators; such as transparency, accountability conditional, participative, right to equality and balanced rights and responsibilities.

## 1. Transparency

The questionnaire result showed that the statement “service system via internet” had a higher frequency score. Local government of Gorontalo had to understand that in this digital era, internet users using smartphone in Gorontalo continuously increased from year

to year. Besides, access connecting Gorontalo (the regency) and Gorontalo (the city) was close enough. Consequently, the local government of Gorontalo was challenged to transform public services of each agency, from conventional services into technology-based public service products. As a result, activities related to service system could be carried out via internet.

Benefits obtained by the local government of Gorontalo using technology-based services were:

- a. Efficiency in cost and time
- b. Increase in output service productivity and number of service users
- c. As the means to socialize government performance and program
- d. Increase in public satisfaction index, so public trust in government can be restored

Benefits obtained by people using technology-based services were:

- a. Efficiency in cost and time, no need to come to service counters
- b. No need to queue, all procedures and documents can be processed online
- c. Fast and right access because it was already online based services
- d. Information given was all official and informative

## 2. Accountability

The questionnaire result showed that people more expected service system complying with minimal service standard. This should be considered by each government agency providing services. They should reconsider their governance inseparable from the basic principles of good governance (transparency, participation, and accountability as the main element). Terminology of good governance was yet standard, but there were a lot of definitions that tried to convey the meaning of good governance. However, it could not be denied that good governance was considered an important element to promote national welfare. Therefore, it was important for employees in each agency to understand that while providing service, they should meet the governance of service operational standard. The understanding mattered, because the government was not serving themselves but the society. As a consequence, regarding service provision, the service standards under the Law Number 25 of 2009 had to be considered. The government should bring benefit for society. They had to also avoid to be a difficult and exclusive bureaucracy. The demand of good governance

and society critics for the low quality of public service forced government to come up with innovation. The innovation was absolutely required to quickly overcome problems faced by society.

### 3. Conditional

The result of data analysis showed that the statement “the speed of service from employees” and “employees’ ability in providing services” had an equal frequency scores. Those statements had to be considered by each employee in the local government of Gorontalo. Essentially, service was a series of activities, so the service process should be performed regularly and continuously, covering all organizational life of society. The intended process was carried out by fulfilling needs between service receivers and providers. For this reason, each employee had to understand that service was the main activity for people engaging in service field, both commercial and non-commercial, where the activity was more intended to provide service for society (public or general services) that did not look for profit, but devotion-oriented.

### 4. Participatory

The analysis result showed that the statement “services must be provided indiscriminately” had a higher frequency value. This showed that employees in service department should provide service for all of people regardless their ethnicity or religion. The equal service should be given because public services were carried out by an individual, a group or an agency to provide assistance and facility for society. Therefore, the service provision had to be done indiscriminately to achieve certain goals. This public service was getting important because it always related to general public with various interests and goals. Employees assigned in public services had to be aware that they worked in a government agency, a bureaucratic organization operating public services.

### 5. Right to Equality

The questionnaire result showed that the statement “a right to provide services” had a higher frequency score. This should be noted by each employee of the local government agencies of Gorontalo. In service provision, the following public service standards should be met:

- a. Service procedures
- b. Fulfillment time
- c. Service products
- d. Service costs
- e. Facilities and infrastructures
- f. Employees’ competence in service provision

This was in line with a theory proposed by Sinambela (2010) that public services were a fulfillment of wants and needs of society by state officials.

## V. CONCLUSIONS

According to data analysis, bureaucratic behavior, organizational culture and leadership simultaneously provided positive and significant effects for public services in the local government of Gorontalo. Improvement carried out in each aspect would improve the quality of public services in each government agency, which certainly would satisfy people obtaining the services. In the future, the local government of Gorontalo is expected to pay attention to the employee placement and assignment. The placement and assignment should be done according to their scientific background. It is important to establish procedures for assigning and placing leaders and employees to comply with applicable rules. Employees’ consistency in providing services also has to refer to applicable values and rules in the government of Gorontalo.

## REFERENCES

- [1] Banks, F. E. (2000) ‘Kyoto negotiations on climate change: an economic perspective’, *Energy Sources*.
- [2] Berry, L. L., Parasuraman, A. and Zeithaml, V. A. (1988) ‘The service-quality puzzle’, *Business Horizons*.
- [3] Brata, A. A. (2003) ‘Dasar-Dasar Pelayanan Prima’, (Jakarta: PT. Elex Media Komputindo, 2003).
- [4] Chomitz, K. et al. (1999) What Do Doctors Want? Developing Incentives for Doctors to Serve in Indonesia’s Rural and Remote Areas.
- [5] Corcoran, S. (2009) ‘Defining Earned , Owned And Paid Media’, *Forrester Research Blog*.
- [6] Davis, K. (1967) ‘Understanding the social responsibility puzzle’, *Business Horizons*.
- [7] Denhardt, R. B. and Denhardt, J. V. (2000) ‘The new public service: Serving rather than steering’, *Public Administration Review*.
- [8] Erikson, E. (1968) *Youth: Identity and crisis*, New York, NY: WW.
- [9] Fayol, H. (2013) ‘Principios de Henry Fayol’, los 14 principios de henry fayol.
- [10] Fesler, J. W. (1948) ‘The Administrative State; A Study of the Political Theory of American Public Administration. By Dwight Waldo. (New York: Ronald Press Company. 1948. Pp. viii, 227. \$5.00.)’, *American Political Science Review*.
- [11] Gist, J. R. (1989) ‘Decision Making in Public Administration’, in *Handbook of Public Administration*.
- [12] Hair, J. F. et al. (2012) ‘An assessment of the use of partial least squares structural equation modeling in marketing research’, *Journal of the Academy of Marketing Science*.

- [13] Hakim, A. (2017) 'KONTRIBUSI LINGKUNGAN KERJA, PERILAKU KEPEMIMPINAN DAN MOTIVASI KERJA TERHADAP KINERJA PEGAWAI BALAI WILAYAH SUNGAI SULAWESI', Jurnal Manajemen.
- [14] Hanif, N. (2005) Teori dan Praktik Pemerintahan dan Otonomi Daerah, PT Grasindo.
- [15] Hennala, L., Parjanen, S. and Uotila, T. (2011) 'Challenges of multi-actor involvement in the public sector front-end innovation processes: Constructing an open innovation model for developing well-being services', European Journal of Innovation Management.
- [16] Hersey, P. and Blanchard, K. H. (1969) 'Management of Organizational Behavior', Prentice-Hall Inc., 1969 (Cloth and Soft cover. Soft cover \$3.95)', Academy of Management Journal.
- [17] Juneman, Meinarno, E. A. and Rahardjo, W. (2013) 'Symbolic Meaning of Money, Self-esteem, and Identification with Pancasila Values', Procedia - Social and Behavioral Sciences.
- [18] Katuuk, O. M., Mewengkang, N. and Kalesaran, E. R. (2016) 'Peran Komunikasi Organisasi Dalam Meningkatkan Eksistensi Sanggar Seni Vox Angelica', Acta Diurna.
- [19] Kurniawan, H. et al. (2011) 'E-CULTURAL HERITAGE AND NATURAL HISTORY FRAMEWORK: AN INTEGRATED APPROACH TO DIGITAL', in 2011 International Conference on Telecommunication Technology and Applications.
- [20] Leonardo, E. and Andreani, F. (2015) 'PENGARUH PEMBERIAN KOMPENSASI TERHADAP KINERJA KARYAWAN PADA PT. KOPANITIA', Geophysical Research Letters.
- [21] Li, H., Lee, K. C. and Lai, V. S. (2009) 'Interpersonal relationship needs of virtual behavior: From virtual communities to virtual worlds', in 15th Americas Conference on Information Systems 2009, AMCIS 2009.
- [22] Mangkunegara, I. (2015) 'PENGARUH KARAKTERISTIK KEUANGAN DAN HASIL PEMERIKSAAN PADA KESEJAHTERAAN MASYARAKAT DI PROVINSI SUMATERA UTARA', Jurnal Tata Kelola & Akuntabilitas Keuangan Negara.
- [23] Mcleod, R. (2004) 'Management Information Systems Chapter 8', in Management Information Systems.
- [24] Moenir, H. A. S. (2010) 'Manajemen pelayanan umum di Indonesia / H.A.S. Moenir', Manajemen pelayanan umum di Indonesia.
- [25] Pratt, L. and Denison, D. (2000) 'The language of the Southey-Coleridge Circle', Language Sciences.
- [26] Puspitasari, N. L. P. and Bendesa, I. K. G. (2016) 'Analisis Kualitas Pelayanan Publik di Badan Pelayanan Perijinan Terpadu Kabupaten Badung', E-Jurnal Ekonomi dan Bisnis Universitas Udayana 5.1 (2016).
- [27] R.R., L. et al. (2017) 'The relationship between caregiver burden, patient behavioral symptoms, and memory clinic services', Journal of the American Geriatrics Society.
- [28] Rasoolimanesh, S. M. et al. (2016) 'How Visitor and Environmental Characteristics Influence Perceived Crowding', Asia Pacific Journal of Tourism Research.
- [29] Ratminto, R. (2005) 'Teknik, Mekanisme Dan Model Penilaian Kinerja Aparatur Pemerintah', Jurnal Administrasi Publik Unpar.
- [30] Robbins, S. P. and Judge, T. A. (2008) 'Perilaku Organisasi Jilid II', Salemba Empat.
- [31] Setiawan, daryanto (2017) 'Dampak Perkembangan Teknologi Informasi dan Komunikasi Terhadap Budaya Impact of Information Technology Development and Communication on', Jurnal Pendidikan.
- [32] Sinambela, L. P. (2010) Reformasi Pelayanan Publik Teori Kebijakan dan Implementasi, Bumi Aksara.
- [33] SISWANTO, S. (2019) 'ANALISIS LAPORAN KEUANGAN UNTUK MENILAI KINERJA KOPERASI PEGAWAI REPUBLIK INDONESIA (KPRI)', Jurnal Pendidikan Akuntansi Indonesia.
- [34] Stein, J. W. (1975) 'Introducing public administration', Teaching Political Science.
- [35] Tjiptono (2007) Strategi Pemasaran, edisi kedua, Edisi Kedua. Yogyakarta: Andi.
- [36] Tjiptono, F. (2008) Kualitas pelayanan itu sendiri meliputi kualitas struktur, kualitas proses dan kualitas hasil, Yogyakarta : ANDI Offset.
- [37] Tjiptono, F. and Chandra, G. (2005) 'Manajemen Kualitas Jasa', Yogyakarta. ANDI.
- [38] Wilson, W. (2006) 'The Study of Administration', Political Science Quarterly.
- [39] Yamin, M. and Goleorkhi, S. (2010) 'Cultural distance and the pattern of equity ownership structure in international joint ventures', International Business Review.
- [40] Zahara, G. (2015) 'The influence of Competence Local Government Agencies and The Implementation Government of Internal Control System toward the Quality of Local Government Financial Statement', Research Journal of Finance and Accounting Online).

# Theory-practice interaction in engineering teaching: Pedagogical experience in the "Management and Treatment of Effluents" course from chemical engineering program

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**Abstract**— Over the years, higher education has been the subject of intense debate and discussion, as the traditional teaching approach, based on theoretical knowledge, concepts and information is no longer sufficient. In chemical engineering courses, this practice is no different, but with the dynamics of the current world and the increasingly competitive job market, it is essential to train professionals with creative, multidisciplinary skills, able to develop reflective thinking. Thus, the crucial challenge in terms of teaching quality in engineering is based on identifying ways to encompass the social and technological changes in the current world in the manner of teaching. An excellent alternative is to increase students' contact with the practice since it allows the execution of theoretical concepts. Therefore, the main objective of this work is to present the importance and positivity of pedagogical experience that occurred with the theory-practice integration implemented in the "Management and Treatment of Effluents" class from Chemical Engineering program at the UNILA, Brazil. A practical activity was developed where students, under the professor's supervision, developed a project of a water treatment plant, after conducting expository classes and technical visits in industries that have wastewater treatment. Once the project was concluded, a survey was sent to the students to gather opinions regarding the activities carried out. From authors and students, this sort of activity represents an interesting tool in the teaching/learning process, since it stimulated the development of some multidisciplinary skills besides the students' motivation in the program.

**Keywords**—chemical engineering, higher education, pedagogical experience, teaching/learning, theory-practice integration.

## I. INTRODUCTION

Engineering as a profession must improve the world for the good of all, where the professional training of engineers requires the acquisition of a body of specialized knowledge, problem-solving skills and common sense at the service of society. Every professional engineer, therefore, is called not only to achieve a certain degree of intellectual and technical mastery, but also to acquire practical wisdom that brings together knowledge and skills in the way that best serves a specific purpose for the good of humanity. (Sheppard et al., 2006).

The objective of training engineering students is to prepare professionals with a deep knowledge of technical

fundamentals and broadly prepared with the necessary skills to work in engineering. (Crawley et al, 2007), where practical activities must be part of the context in the education of future engineers, with the real learning experience of students in the classroom significantly different from learning in the workplace (Cheah & Yang, 2013).

Technical visits to companies, or any environment in which the future engineer works, are important tools that provide opportunities for students to observe the application of the theory learned in the classroom (Masturah Markom et al., 2011), making students more

interested and engaged when knowledge and concepts are closer to reality (Barnett & Coate, 2005).

Student learning outcomes after visits may include the ability to: better visualize processes and products manufactured in industries, improve interpersonal skills, increase awareness of the roles and ethics of engineers and the impacts of industrial processes on health, safety, environment and society (Masturah Markom et al., 2011).

Therefore, the main objective of this work is to present the importance and positivity of the pedagogical experience that occurred with the theory-practice integration implemented in the “Management and Treatment of Effluents” class from Chemical Engineering program at the Federal University of Latin American Integration (UNILA) located in the city of Foz do Iguaçu, Paraná, Brazil.

## II. APPLIED METHODOLOGY

The Management and Treatment of Effluent course from the Chemical Engineering program at UNILA aim to provide an understanding of the water quality parameters that influence the choice of treatment; To understand how water quality management works; and provide critical analysis of the technologies available for the treatment of effluents, regarding the decision making of the economically viable (Unila, 2020).

With the purpose of making this discipline more dynamic, during the second semester of 2019, a practical activity was developed in which students, under the supervision of the professor, developed a project of a water treatment plant, after conducting theoretical classes and technical visits in local industries that have wastewater and water treatment.

Before the technical visits, the students reviewed the topic seen in the classroom and defined some points to be observed and questioned to the technicians, as they would be visualizing in practice the subject learned theoretically.

The first technical visit was conducted at the poultry industry of Cooperativa Lar, located in the city of Matelândia (PR, Brazil). The poultry unit slaughters an average of 270 thousand birds/day, and there is an environmental concern regarding the industrial waste and water treatment, in which the purification is carried out through several lagoons, which generate biogas and in the later phase, they return to Xaxim river (Lar, 2020). In this visit, the students had the opportunity to see the complete treatment of industrial waste, though, the focus of the visit was to learn how the company performs the poultry slaughter water treatment, i.e. the wastewater.

The second technical visit was carried out at the Companhia de Saneamento do Paraná (Sanepar), in the city of Foz do Iguaçu (PR, Brazil). This company is responsible for providing basic sanitation services to 345 of the 399 cities in the state of Paraná. The company maintains one of the vastest structures in Brazil in basic sanitation, with 168 Water Treatment Plants and more than 55 thousand kilometers of distribution network. The water is treated with chlorine, to guarantee the quality, and with fluorine, to prevent dental caries. Besides, the company follows water quality control and surveillance procedures, determined by the Ministry of Health. (Sanepar, 2020). In this technical visit, the students checked how the water treatment we consume in our homes is carried out step by step and took the opportunity to review any doubts they had up to then.

For the sake of knowledge, a brief explanation of a water treatment plant, represented by Fig. 1, follows.

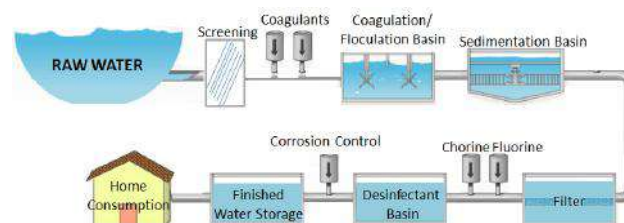


Fig. 1: Water Treatment Plant (Adapted from Denver Water, 2020)

The basic principles into the water treatment process are usually the same, with slightly variations at different locations, depending on the technology of the plant and the water it needs to process (Bittencourt & De Paula, 2014). A brief explanation of the steps is presented below:

1. Screening: Water passes through the grating to the removal of macroscopic elements, such as leaves, stone and wooden pieces.
2. Coagulation: The pH is adjusted and water is rapidly mixed with aluminum sulfate, a coagulant that helps the impurities stick together to form bigger particles called floc.
3. Flocculation: In this step, occurs the agitation of the water to favor the union of the particles and the floc has time to grow bigger.
4. Decantation: The heavy floc particles are deposited on the bottom, separating from the water.
5. Filtration: The water passes through gravel, sand and activated charcoal filter to remove floc and any remaining microscopic particles and microorganisms.

6. Disinfection: Water is disinfected before it enters the distribution system. In this stage occurs the addition of chlorine and fluorine to remove disease-causing microorganisms. Right after this step, the addition of alkaline substances occurs to reduce corrosion in the distribution system and the plumbing.

7. Distribution: The treated water is distributed to the population.

To carry out the practical project, the students were divided into 6 groups, with a maximum of 6 students in each group. Each group had to think about how they would make their water treatment plant. They had a direct channel to ask me questions. They also had a discipline monitor to help them. We didn't interfere in the structure; we just checked if the project's thinking and progress was correct or not.

Considering the discipline project, students had to comply with steps 1 to 5, and sequences 2, 3, and 4 could be coupled in a single step. The filter should have at least sand, gravel or stone, charcoal, and cloth or cotton, as shown in Fig. 2.

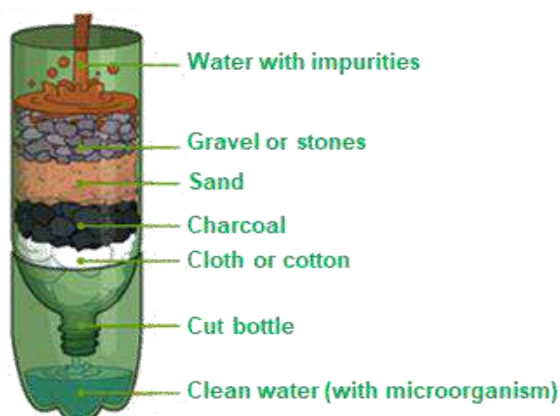


Fig. 2: Water Filter Illustration (Adapted from Sustentável, 2020)

The material carried out to the water treatment plant project was selected by the students, but mostly recycled one was applied. It was also requested that, if possible, they innovated in some stage of the project, arousing even more interest in student participation and, at the same time, interacting with other disciplines.

After theoretical classes and technical visits, the students were able to carry out the water treatment plant project. For the presentation of the project, the students provided the necessary resources in advance, and prepared a pitch presentation, integrating the discipline of Innovation and Entrepreneurship.

Once the project was concluded, a survey (Fig. 3) was sent to the students to gather opinions regarding the activities carried out. Besides, all the students signed a term of authorization and consent for use of image, voice, performance, artwork or likeness (Fig. 4).

Survey Regarding the Management and Treatment of Effluent Course: 02/2019  
Program: Chemical Engineering, UNILA  
Professor: Dr. Karine Zanella

One of the crucial concerns about introducing an innovation in the classroom is with the result achieved. In this case, I try to gather from students their opinion about the theory-practice integration of the Water/Wastewater Treatment Plant Project elaborated in the course of Management and Treatment of Effluents, of the Chemical Engineering program at the Federal University of Latin American Integration - UNILA, taught in the second academic semester of 2019.

I will publish the results of this research in a congress and/or article in a scientific journal. Otherwise, they will contribute to possible improvements in the discipline in question and other ones.

There are two major groups on the survey: Positive and negative points of the project, that is, what you evaluate as positive and negative aspects related to the project. Please be sincere in your answers. The publications will be maintaining the confidentiality and, no personal issues will be applied.

At the end of the survey, I request you to leave a **brief statement about what you thought of the project as a whole.**

THANK YOU!

PS: You can use as many lines as necessary for your answer. If you do not have an answer to the topic, leave it blank.

#### Positive and Negative Aspects of the Project

- |   |  |
|---|--|
| ✓ Related to the Project preparation stage: | ✓ As for the interaction with other area |
| ✓ Related to teamwork:                      | ✓ As for the pedagogical practice:       |
| ✓ As for the technical visit:               | ✓ Related to skill development:          |
| ✓ As for the presentation of the Project    |  |

#### Project Statement

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Fig. 3: Applied Survey – Translated from the original survey in Portuguese

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AUTHORIZED, free of charge and without any burden, Professor Karine Zanella and collaborators,  
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INTERACTION IN ENGINEERING TEACHING: PEDAGOGICAL EXPERIENCE IN THE  
'MANAGEMENT AND TREATMENT OF EFFLUENTS' COURSE FROM CHEMICAL  
ENGINEERING PROGRAM, and in its dissemination, if any, in all possible means of  
dissemination, whether in the printed media (books, catalogs, magazines, newspapers, among  
others), television (advertisements for television, videos, films, among others), radio (radio  
programs/podcasts), internet, computerized database, multimedia, among others, and in the internal  
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Fig. 4: Term of authorization and consent - Translated from the original term in Portuguese

The assessment was carried out exclusively by the professor in charge, making an assessment of all stages of the treatment station and assigning points to each one. The project itself was worth 1/3 of the final grade.

### III. RESULTS AND DISCUSSION

In this topic, the photographs of the technical visits, of the projects and the students' statements are shown. The most important thing of this project is that the students studied and work by themselves to do the layouts, and were pleased to have done so.

The photographs taken in the technical visits are shown in Fig. 5. The technical visits, as the professor's opinion, were a great teaching tool, because, in addition to providing support in conducting classes, it allows students to contact the practical application of the content learned in the classroom. In addition, students were able to reunite the academic universe with the professional universe, providing participants with a broader education.

In the visits, it was possible to observe the environment of the companies in full operation, to verify their dynamics, organization, and all the theory factors implicit in it. During the technical visit, the objectives were fully achieved, as there was a positive integration between the participants, mainly through the exchange of experiences among students, professors, and professionals in the field.

The students not only found in the companies visited the knowledge acquired in the academic activity, but added personal and professional values, in addition to being even more motivated for the future exercise of the profession in related areas. Given this, it is clear that the technical visits went very well within all programmed expectations and that the class benefited from this type of initiative.



Fig. 5: Technical Visits at Cooperativa Lar and Sanepar.

The photographs of Water Treatment Projects of the six groups are shown in Fig.6.

It is possible to observe in Figure 5, that the groups have diverse structures for water treatment projects, but they all achieved the objective of cleaning contaminated water with soil. The 5th group, placed in its project a barrier for oils and fats (inside the red circle), which is widely used in wastewater treatment. Furthermore, all groups made the filter like the one shown in Figure 2.

The last group (number 6), applied natural Aloe Vera leaf gel as a coagulant, an alternative that has been applied in place of synthetic coagulants, possible causes of toxicity (Borri, Freire, & Boina, 2014; Rodrigues, Aquino, & Cordeiro, 2020). The other groups applied aluminum sulfate as a coagulant, and as it was in high concentration, the treated water from this ones, was not tried, as a safety manner.



Fig. 6: Students groups with their Water Treatment Plant Project.

This type of research of the group, for a natural alternative as a coagulant, presents itself as the students' engagement in the project, being another proof of how important practical teaching is.

As mentioned before, once the project was conclude, students were asked to answer a survey about their opinions on the project. Some of the students' statements are presented in Table 1, with some highlighted phrases. It is important to share that some statements are not complete.

Table 1: Students' Statements

Students' Statements
"... It was an engaging discipline giving guidance on the part of my career that I want to concentrate on." K. Y. G. A.
"... It was the first time that students had been able to make a scale model of an engineering process. We ran into issues that the engineer will have to deal with, such as the possibility of discussing a project from the beginning with a group. - A. V.
"... The Water Treatment Plant Project helped to understand what had been learned in the classroom, besides

it was an alternative way of learning and working then that we are used to." S. B. C. B.

"In general, the project was intriguing and very enriching. We could think and learn to deal with the error and adversities generated throughout processes. Have the opportunity to assemble from planning to the presentation of a water treatment plant made it possible for me to develop in other ways and to achieve the interdisciplinary that is of us required..."- I. S. Z.

"It was a diverse and advantageous way to learn. When you put into practice the theoretical contents seen in the classroom, it was considerably easier to understand and set what was studied. The technical visits assisted me in understanding each step of the effluent treatment [...] including helping to link the stages that we implemented in the project and to discuss possible ideas to optimize the process" T. M.

"In my opinion, having a practical and didactic approach to the content is a great way to understand, remember, and optimize some characteristics of the process. The practice and theoretical contents, together with the technical visit, were necessary to establish the concepts related to a water/wastewater treatment plant..." D.B

"...The implementation of the Water/Wastewater Treatment Plant Project was a very enriching experience, both in the discipline of Effluent Management and Treatment, as well as within the Chemical Engineering Program; because it is not always possible to work practically with concepts developed in the classroom..." M.G.V.

"... A great way to learn anything is through practice and having spaces where you can make mistakes when performing an action, which is not possible with the current educational system. Therefore, initiatives such as taking in the discipline of Effluent Management and Treatment are always welcomed by the students." F. M. C. L.

As main result, from the point of view of the authors and the students themselves, this sort of activity developed represents an interesting tool in the teaching/learning process, since it stimulated the development of some multidisciplinary skills besides the students' motivation in the program.

The students' statements serve as a reference to improvements in the next practical activities carried out, both in the discipline of management and treatment of

effluents and in other disciplines. Therefore activities can be planned and, the results obtained in the next semesters even more satisfactory.

#### IV. FINAL CONSIDERATIONS

During the semester in which the project took place, the theoretical concepts were approached in the classroom, and two technical visits made. In this way, the students could assimilate the theory with the reality of the industries. After that, a project was proposed to the students to put into practice what they have learned.

What we observed in the development of the discipline Management and Treatment of Effluents is that the realization of the Water Treatment Plant project represents a tool of considerable importance for learning. It stimulated motivation, developed skills, and facilitated the relationship between theoretical concepts and the practical application of engineering. Also, the project contributed to increasing the degree of achievement in the discipline since the interest rates changes and, the student starts to dedicate more.

It is worth mentioning that not only did the students' statements confirm the great results, but some observations in the classroom (such as the students' engagement) were crucial for this teaching dynamics (theory-practice) to be continued and applied in other disciplines.

#### ACKNOWLEDGEMENTS

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#### REFERENCES

- [1] Barnett, R., & Coate, K. (2005). *Framing Curriculum. Engaging the Curriculum in Higher Education*. Maidenhead: SRHE and Open University Press. Chapter 2.
- [2] Bittencourt, C., & De Paula, M. A. S. (2014). *Tratamento de água e efluentes: Fundamentos de saneamento ambiental e gestão de recursos hídricos*. São Paulo, SP: Editora Érica.
- [3] Borri, R. B., Freire, R., & Boina, W. L. O. (2014). Remoção da turbidez da água usando aloe vera como coagulante natural. *X Fórum Ambiental da Alta Paulista*, 10 (12), 01-11.
- [4] Crawley, E. F., Malmqvist, J., Ostlund, S. & Brodeur, D.R. (2007). *Rethinking Engineering Education*, New York: Springer.
- [5] Cheah, S.M., & Yang, K. (2013). Teaching Engineering Practice in Chemical Engineering via Experiential Learning, *Proceedings of the 7th International Symposium on Advances in Technology Education*, Japan.
- [6] Felder, R. M., Woods, D. R., Stice, J. E., & Rugarcia, A. (2000). The future of engineering education II. Teaching methods that work. *Chemical Engineering Education*, 34(1), 26-39.
- [7] Lar. (2020, August 02). *Unidade Industrial de Aves e Carnes - UIA e UIC*. [http://www.lar.ind.br/v4/institucional/index.php#l\\_industrias?id=11](http://www.lar.ind.br/v4/institucional/index.php#l_industrias?id=11)
- [8] Markom, M., Khalil, M. S., Misnon, R., Othman, N. A., Abdullah, S. R. S., & Mohamad, A. B. (2011). Industrial Talk and Visit for Students. *Procedia - Social and Behavioral Sciences*, 18, 674-682.
- [9] Mobarak, H. M., Wu, H., & Hossain, M. (2016). Effective Teaching Method for Engineering Education from Student's Perspective. Sydney. *International Conference on Engineering Education and Research*.
- [10] Pott, R. W. M., Wolff, K. E., & Goosen, N. J. (2017). Using an informal competitive practical to stimulate links between the theoretical and practical in fluid mechanics: A case study in non-assessment driven learning approaches. *Education for Chemical Engineers*, 21, 1-10. <https://doi.org/10.1016/j.ece.2017.08.001>
- [11] Rodrigues, A. M., Aquino, D. S., & Cordeiro, L. L. (2020). Avaliação de Aloe arborescens como coagulante para remoção de cor e turbidez em tratamento convencional de água. *Ingeniería del agua*, 24 (2), 81-88.
- [12] Sanepar. (2020, July 19). *Água*. <http://site.sanepar.com.br/a-sanepar/servicos/agua>
- [13] Sheppard, S., Colby, A., Macatangay, K., & Sullivan, W. (2006). What is Engineering Practice? *International Journal of Engineering Education*, 22(3), 429-438.
- [14] Sustentável. (2020, August, 01). Filtro de água caseiro: Como fazer. <https://sustentavel.com.br/filtro-de-agua-caseiro/>
- [15] Unila. (2020, July 21). *Projeto Pedagógico do Curso de Engenharia Química* [PDF File]. <https://portal.unila.edu.br/graduacao/engenharia-quimica/arquivos/ppc-engenharia-quimica-1.pdf>
- [16] Walkington, J., Pemberton, P., & Eastwell, J. (1994). Practical work in engineering: A challenge for distance education. *Distance Education*, 15 (1), 160-171. <https://doi.org/10.1080/0158791940150111>

# Financial Management of Pharmacies in the City of Cabanatuan, Philippines

Alvin Gino M. Bautista

**Abstract**—This research was made to determine the effectiveness of selected small-scale pharmacy store owners in Cabanatuan City, Philippines in terms of their financial management that will focus on cash and accounts payable management. It involved 16 small-scale pharmacy businesses operating near the government hospitals in Cabanatuan City such as Dr. Paulino J. Garcia Memorial Research Center, Manuel V. Gallego, Cabanatuan City Hospital, and Eduardo L. Joson Provincial Hospital. These Small-Scale Pharmacy Business includes sole proprietorships and partnership type of business, Other pharmacy stores located in the same area were not included because they belong to the corporate type of business.

The outcome of this research will be useful and valuable to the Small-Scale Pharmacy Store owners and it will provide necessary pieces of information about management styles which could be of significant help to the small-scale pharmacy store owners. It can also help them to be more efficient in handling their cash and accounts payable through the help of the recommendation by the researcher. To the Product Suppliers, the outcome of this study will be helpful to the suppliers of different small-scale pharmacy stores in the matter of mode of payment and incentives given to the owners which are most important to motivate them to sell more. To the Investors, the results of this study can help investors who want to have a small-scale pharmacy store in terms of cash and payable handling and dealing with problems that their business might encounter. To the Philippine Economy, the results of this study will strengthen and back up the economy of the Country. Since the study aims to evaluate the business profile of the small-scale pharmacy store owners including managing their working capital, it also includes the evaluation of the competitiveness of their business. This only means that the study wishes to find out more about the nature of the existence of the said enterprises as well as their relationship to their suppliers and customers. Lastly, this will also be beneficial to future researchers to draw pertinent results to their studies.

The researcher also wishes to evaluate the literacy of selected small-scale pharmacy businesses within the City of Cabanatuan, Philippines along with the areas of cash management and accounts payable management using the descriptive method of research.

**Keywords**— Pharmacy, Financial Management, Cash Management, Accounts Payable Management, Small-Scale Businesses.

## I. INTRODUCTION

A community pharmacy or drug store is one of the most constant industries in the Philippines because medicine is essential nowadays, and demand uninterruptedly increases as the population continuously increasing. The majority of those who go into this business are pharmacists or doctors because they know a lot about medicine, but because business is open for everybody, whoever wants to establish this kind of business can create one as long as they will follow the rules and regulations provided by the Philippines law.

The State recognizes the vital role of pharmacists in the delivery of quality health care services through the provision of safe, effective, and quality pharmaceutical products, pharmaceutical care, drug information, patient medication counseling, and health promotion. The pharmacists' professional services shall, therefore, be promoted as an indispensable component of the total health care system to ensure the physical well-being of the Filipinos. (Section 2 of RA. 10918)

Small scale enterprises s are privately owned sole proprietorships or partnerships, that have fewer employees

and/or less annual revenue than a regular-sized business or corporation. Small businesses are either services or retail operations like grocery stores, medical stores, tradespeople, bakeries, and small manufacturing units. Small businesses are independently owned organizations that require less capital and less workforce and less or no machinery. These businesses are ideally suited to operate on a small scale to serve a local community and to provide profits to the company owners.

Cash management is a terrifying thing for any enterprise to regulate. Inappropriate cash management can lead to unnecessary debt or even insolvency. The absence of cash management can put small-scale businesses out of business, it is because they do not have well cash management. Absence of cash management system or at least carefully monitoring cash, a business can become non-solvent very fast because they do not have existing cash for regular or unexpected expenses. Many small Pharmacy businesses struggle with cash management because they are reliant on sales and on-time payments. It is comparable to the personal financial problem of living paycheck to paycheck, with nothing available from week to week.

Accounts payable and its administration is vital for the smooth operational procedure of any business entity. It is significant for any business because it mostly takes the responsibility of disbursing the entity's bills on a timely basis. This is necessary so that solid credit and long-term affairs with the suppliers can be continued. Only when bills are paid on time, sellers will safeguard a continuous flow of supplies and services; which in turn will aid in the systematic flow of the enterprise. A good accounts payable procedure ensures there are no late responsibilities, penalty or late charges to be paid for the dues. The prepared accounts payable procedure ensures all that the bills due are traced and paid correctly. This will help avoid lost expenditures and making a payment double. It also allows businesses to accomplish improved cash flows. Frauds and thefts can be away from to a superior extent by following strict accounts payable procedures.

The problem which the researcher wishes to study is about the condition of the Pharmacy Store Business which are considered as the micro, small and medium enterprises that are protected by Republic Act 10918 - An Act Regulating and Modernizing the Practice of Pharmacy in the Philippines. And Republic Act 5921 - An Act Regulating the Practice of Pharmacy and Setting Standards of Pharmaceutical Education in The Philippines and for Other Purposes. The researcher also wishes to evaluate the literacy

of selected small-scale pharmacy businesses within the City of Cabanatuan along with the areas of cash management and accounts payable management.

## OBJECTIVES OF THE STUDY

The research was made to determine the effectiveness of selected small-scale pharmacy store owners in Cabanatuan City in terms of their financial management that will focus on cash and accounts payable management.

The objective of this research is sought to answers the following questions:

1. How may the business profile of the selected small-scale pharmacy store owner- respondents be described in terms of:
  - 1.1 Types of Business Ownership
  - 1.2 Year Established
  - 1.3 Number of Years in Business
  - 1.4 Numbered of Registered Pharmacist Employed
  - 1.5 Number of Pharmacy Assistant Employed
  - 1.6 Type of Store Ownership
  - 1.7 Terms of Payment to the Suppliers
  - 1.8 Incentives from the Suppliers
    - 1.8.1 Discounts
    - 1.8.2 Commission
    - 1.8.3 Vacation
2. Describe the working capital of small-scale pharmacy business in terms of:
  - 2.1 Cash
  - 2.2 Accounts Payable
3. What are the problems encountered by the Pharmacy store owners with their:
  - 3.1 Suppliers
  - 3.2 Customers
4. Impact of the study of the small-scale pharmacy to the following:
  - 4.1 Owners
  - 4.2 Suppliers

## II. METHODOLOGY

The researcher used the Descriptive Survey Method of research. The study wishes to find out and describe the present profile of the business of selected small-scale pharmacy businesses within Cabanatuan City, Philippines;

their efficiency in financial management in terms of cash, and their accounts payable.

The study involved all the owners of selected small-scale pharmacy business near the surrounding of Government Hospitals located in Cabanatuan City. There are 3 Government Hospitals in the City of Cabanatuan such as Paulino J. Garcia Memorial Research Medical Center, located at Mabini cor Gen. Tinio St, Cabanatuan City. Manuel V. Gallego Cabanatuan City Hospital located at Pan-Philippine Hwy, Zulueta, Cabanatuan City, Nueva Ecija. Eduardo L. Joson Memorial Hospital (Nueva Ecija Provincial Hospital), located at Pan-Philippine Highway, Daang Sarile, Cabanatuan City, Nueva Ecija.

The researcher used a set of survey questionnaires to gather pertinent data. The interview will also be used to clarify aspects that will not be able to discuss satisfactorily by the questionnaire. The questionnaire was constructed by the researcher through their review of related literature.

### III. RESULTS AND DISCUSSION

#### 3.1. Profile of the Business

*Table 1 Type of Business*

Type of Business	Frequency	Percentage
Sole Proprietorship	13	81%
Partnership	3	19%
Total	16	100%

Table 1 shows a total of 16 small-scale pharmacies were surveyed and based on the result, 13 or 81% are Sole Proprietorships and 3 out of 16 or 19% are Partnership. It means that the majority of the Small-Scale Pharmacy Businesses operating in the area were Sole Proprietorship.

*Table 2. Number of Years in the Business*

Years	Frequency	Percentage
0-5 years	6	38%
6-10 years	3	19%
11-15 years	3	19%
16-20 years	1	6%
21-25 years	2	13%

26 and above years	1	6%
Total	16	100%

The number of years in the business of the pharmacies shows in Table 2 means 38% are 0-5 years, 19% are 6-10 years, 19% are 11-15 years, 6% are 16-20 years, 13% are 21-25 years, and 6% are 26 years and above. It means many of the respondents were in the star-up stage of the business.

*Table 3 Number of Registered Pharmacist Employed*

Pharmacist Employed	Frequency	Percentage
1 Registered Pharmacist	15	94%
2 Registered Pharmacist	1	6%
Total	16	100%

Based on the survey conducted by the researcher, Table 3 shows that 94% of the respondents employed 1 registered pharmacist and 6% employs 1 registered pharmacist. It simply means that all respondents employed a pharmacist in obedience to the Republic act no. 5921. an act regulating the practice of pharmacy and setting standards of pharmaceutical education in the Philippines and for other purposes.

*Table 4 Number of Pharmacy Assistant Employed*

Number of Pharmacy Assistant Employed	Frequency	Percentage
1 Pharmacy Assistant	3	19%
2 Pharmacy Assistant	5	31%
3 Pharmacy Assistant	1	6%
4 Pharmacy Assistant	4	25%
5 Pharmacy Assistant	1	6%
6 and above Pharmacy Assistant	2	13%
Total	16	100%

Table 4 shows that 19% of the small-scale pharmacies employ 1 pharmacy assistant, 31% employs 2, 6% employs 3, 25% employs 4, 6% employs 5, and 13% employs 6 and above pharmacy assistants.

Table 5 Type of Store Ownership

Type of Store Ownership	Frequency	Percentage
Owned	2	12%
Rented	14	88%
Total	16	100%

Table 5 shows the frequency and percentage among the 16 respondents of small-scale pharmacy stores, reveals that 88% were renting their store and 13% owned their store. The majority of the respondents have a rental expense that can be deducted from their monthly income.

Table 6 Type of Payment to the Suppliers

Type of Payment to the Suppliers	Frequency	Percentage
Cash Only	2	13%
Cash and Check	12	75%
Cash, Check, and Bank Transfer	2	13%
Total	16	100%

Table 6 shows that 13% of the Pharmacies used only cash in paying their suppliers, 75% were using cash and checks, and 13% were using Cash, Checks, and Bank Transfer Services.

Table 7 Terms of Payment if Purchased on Credit

Terms of payment if purchase on credit to the suppliers	Frequency	Percentage
15 days	1	6%
30 days	9	56%
60 days	2	13%
90 days	4	25%
Total	16	100%

The payment of consigned goods has a specific term which the owner needs to pay the supplier. 6% of small-scale pharmacy stores received terms of payment to the suppliers of 15 days, 56% received 30 days, 13% received 60 days, and 25% received 90 days.

## FINANCIAL MANAGEMENT OF PHARMACY BUSINESS OWNERS

### A. Cash Management

Table 8 Monthly Income

Does the business have a monthly income?	Frequency	Percentage
Seldom	1	6%
Occasionally	3	19%
Sometimes	4	25%
Always	8	50%
Total	16	100%

To have an income is the number 1 goal of every business, thus, Table 8 shows respondents who answered the question if they have a monthly income which reveals 6% answered Seldom, 19% answered Occasionally, 25% answered Sometimes, and 50% answered they had a monthly income from their business.

Table 9 Monthly Bank Deposits

Does the business have a monthly deposit on its bank account?	Frequency	Percentage
Never	1	6%
Occasionally	3	19%
Sometimes	3	19%
Always	9	56%
Total	16	100%

Sales or Income of the business must be deposited to the bank for safekeeping, thus, Table 9 reveals 6% of the respondents answered Never or they have no monthly deposit on their bank account, 19% answered they deposit Occasionally, 19% answered they deposit Sometimes, and the majority of the respondents answered they Always deposit on their bank accounts.

Table 10 Withdrawal for Personal Use

Withdrawal from the business for personal use?	Frequency	Percentage
Never	5	31%
Seldom	2	13%
Occasionally	3	19%
Sometimes	4	25%
Always	2	13%
Total	16	100%

The money of the business must be separated from the personal money of the owner, thus, Table 10 shows, 31% responded Never, 13% responded Seldom, 19% responded Occasionally, 25% responded Sometimes, and 13% answered Always.

Table 11 Use of Check or Bank Services in Paying their Suppliers

Use of check or bank services in paying their suppliers?	Frequency	Percentage
Never	2	13%
Seldom	3	19%
Occasionally	1	6%
Always	10	63%
Total	16	100%

To avoid theft, payment using physical money, and to avoid having counterfeit money, checks and other bank services were available that is suitable in all businesses, thus, 13% of the respondents Never used check or other services in paying their suppliers, 19% used it Seldom, 6% used it Occasionally, and the majority or the 63% used the service of the bank Always.

Table 12 Use of Accounting Software

Does the business use procedure or accounting software in handling their cash, and payables?	Frequency	Percentage
Never	14	88%
Always	2	13%
Total	16	100%

Accounting software benefits include increased accuracy by reducing or eliminating human errors in calculation. Manual bookkeeping processes involve making a lot of mathematical calculations by hand. An incorrect calculation early on the process could have a great impact on the end balance. (A.Walton, 2019) Thus, the question, "Does the business use procedure or accounting software in handling their cash, and payables?", 88% responded Never, while the minority composed of 12% answered they used it Always.

Table 13 Cash Management Literacy

How well do you know Cash Management?	Frequency	Percentage
Very Well	4	25%
Minimal Idea	10	63%
No Idea	2	13%
Total	16	100%

With regards to Cash Management Literacy of the small-scale pharmacy store owners, 63% of the respondents answered they have a Minimal Idea about cash management, 25% of the respondents answered they have a Very Well understanding about it, and the remaining 12% answered they have No Idea about Cash Management.

**B. ACCOUNTS PAYABLE MANAGEMENT***Table 14 Suppliers Who Give Product for Consignment*

Is there a supplier who gives products for consignment?	Frequency	Percentage
Seldom	3	19%
Occasionally	1	6%
Sometimes	7	44%
Always	5	31%
Total	16	100%

Consignment is common in pharmacy business, and this method is good for the consignor as well as to the consignee, thus, Table 14 reveals 19% of the responded answered they received products for consignment from their supplier Seldomly, 6% answered Occasionally, 44% answered Sometimes, and 31% answered they Always received a consigned medicine.

*Table 15 On-time Payment to Supplier*

Does the business pay its supplier on time?	Frequency	Percentage
Occasionally	1	6%
Sometimes	2	13%
Always	13	81%
Total	16	100%

It appears in Table 15 that 6% of the respondents answered they pay their supplier on-time Occasionally, 19% pays Sometimes, and 81% Always pay on time.

*Table 16 Supplier's Discount, Commissions, and Incentives*

Does the business have a past due accounts with the suppliers?	Frequency	Percentage
Never	6	38%
Seldom	3	19%

Occasionally	2	13%
Sometimes	5	31%
Total	16	100%

Past due accounts must be avoided by all the businesses because it will create another expense, thus, Table 16 shows 38% responded Never, 19% answered Seldom, 13% responded Occasionally, and 31% responded Sometimes.

*Table 17 Monthly Interest Payable with the Suppliers*

Monthly interest payable with the suppliers?	Frequency	Percentage
Never	12	75%
Seldom	2	13%
Always	2	13%
Total	16	100%

With regards to interest payable, 75% of the respondents answered they Never have an interest payable, 13% answered Seldom, and another 13% answered Always.

*Table 18 Aging of Accounts Payable*

Does the business use aging of accounts payable?	Frequency	Percentage
Never	8	50%
Seldom	2	13%
Occasionally	1	6%
Sometimes	3	19%
Always	2	13%
Total	16	100%

Table 16 reveals 50% answered they Never used it, 13% answered Seldom, 6% answered Occasionally, 19% answered Sometimes, and 13% Always use it.

Table 19 Accounts Payable Management Literacy

How well do you know Accounts Payable Management?	Frequency	Percentage
Very Well	6	38%
Minimum Idea	8	50%
No Idea	2	13%
Total	16	100%

Table 17 shows Most of the respondents answered they have a Minimal Idea about it and it represents 50% of the total respondents, 38% answered they knew it Very Well, and 12% answered they have No Idea about accounts payable management.

#### The Problems Encountered by the Small-Scale Pharmacy Business Owners

Table 20 Problem Encountered with the suppliers

The Problems Encountered by the Small-Scale Pharmacy Business Owners with their Suppliers	Weighted Mean	Rank
Hard to contact	1.75	1
Always lack of supplies	2.06	2
Supplying poor quality	3.06	3
Not committing on their promise	3.44	4
Cannot deliver on time	4.69	5

The top problem encountered by the small-scale pharmacy business owners is the suppliers that cannot deliver the products on time, followed by Suppliers who are not committing with their promises, then the suppliers which are hard to contact, next was Always lack of supplies, and the least was Supplying poor quality.

Table 21 Problem Encountered with the clients

However, the top problem that the small-scale pharmacy business encountered with their clients based on the survey conducted by the researcher was, Clients who are not bringing their prescription, followed by clients who don't know what is the name of the medicine and dosage needed,

The Problems Encountered by the Small-Scale Pharmacy Business Owners with their Clients	Weighted Mean	Rank
Not bringing their prescription	1.19	1
They don't know what is the name of the medicine and dosage needed	2.75	2
ID for senior citizen's and PWD discount	2.81	3
Irate clients	3.50	4
Shop lifters	4.75	5

then ID for senior citizen's and PWD discount, next is Irate clients, and the list is the problem with the shoplifters.

#### IV. CONCLUSION AND RECOMMENDATIONS

After a thorough gathering of data on the descriptive investigation, the researcher made an analysis of the financial management of small-scale pharmacy business in the City of Cabanatuan, Philippines. The researcher therefore concludes and recommends the following statements: the majority of the respondents are in sole proprietorship type of business, and most of them are in the start-up business, Start-up means a fledgling business enterprise (Merriam-Webster). So many startups fail within the first few years. That's why this initial period is so important. Entrepreneurs need to find money, create a business model and business plan, hire key personnel, work out intricate details such as equity stakes for partners and investors, and plan for the long run. Many of today's most successful companies began as startups. (M.Grant, 2020). The researcher recommends that they must be diligent in handling their income including their cash as well as their expenses together with their accounts payable.

Every pharmacy, drugstore or hospital pharmacy whether owned by the government or a private person or firm shall at all times when open for business be under the personal and immediate supervision of a registered pharmacist: *Provided*, that no pharmacist shall have personal supervision of more than one such establishment. In cases where a drug establishment operates in more than one shift, each shift must be under the supervision and control of a registered pharmacist. (R.A 5921, Sec 27.) The researcher concludes that all respondents abide by this law having proof that they employ at least 1 registered pharmacist that will supervise the pharmacy. It is recommended that although they were following this Act, it is better for them to study this more

thoroughly for the betterment of their business and to have a harmonious relationship between them and the government agencies.

The majority of the respondents use cash, checks, and other bank services in paying their suppliers. It is good for the store owner to avoid counterfeit money and to safe keep their income. Not all of them have a monthly income, the researcher concludes that this is because they are new into the business and many are in the star-up stage. It is also noted that there were some large-scale pharmacies in the same area that is why competition is very tight. The researcher concludes that it is important for the business owner to have an understanding of the products of that bank that they can be used to have a smooth flow business. It is highly recommended to have a seminar for the small-scale pharmacy owner about the bank products and services.

There are many reasons why it is very important to separate the personal finance of the owners and their business finances such as 1. The business is taxed differently from personal finance, 2. This can permit the owner to know the financial performance of the business, 3. If the money is not separated, then it might be problematic to audit when both finances combine. The researcher, therefore, concludes based on the survey conducted that many of them do not know how to separate business and personal finances. This is because only 31% of them answered they never get money from their business for personal use. And there were 13% who get money from their business frequently and this is not good for the business. The researcher also concludes that most of the respondents have a Minimal Idea about Cash Management. It is highly recommended to have a seminar and training for the small-scale pharmacy owners about Cash Management Literacy to be conducted by different agencies like banks, colleges and universities, Department of Finance, Department of Trade and Industries, Bangko Sentral ng Pilipinas, and other financial institutions.

According to Kanya of hashmicro.com, "Nowadays, accounting software has become a vital need for any business. Business owners have started to realize that managing finances manually would not help them achieve the expected results. In many cases, financial management, which is supposed to be able to help companies manage their budgets more efficiently, has become one of the reasons for financial loss." Though this statement is current, the researcher presumed that accounting software was not their priority because it is too expensive and they were thinking that it is not necessary for their business. Though the

researcher agrees that accounting software is too much for the respondents, it is still recommended to try free accounting software that can be downloaded on the internet like the following:

List of free accounting Software:

1. Wave,
2. Zipbooks,
3. Akaunting,
4. SlickPie,
5. GnuCash,
6. CloudBooks,
7. Zoho Invoice
8. NCH Express Accounts

<https://www.fundera.com/>

Some suppliers gave consignment medicines and merchandise to the small-scale pharmacies. Based on the survey conducted, the researcher presumed that most of the respondents pay their suppliers on a timely basis which is very important to have a better connection between them. But there were times that they cannot pay on-time that is why they will get past due accounts and interest payable was automatically added to their expenses. The researcher also concludes that most of the respondents have a Minimal Idea about Accounts Payable Management. The researcher highly recommends to study or use the aging of accounts payable to know the length of time the invoice must be paid, and to avoid interest expense, and to get the cash ready for payment. It is also recommended to have a seminar about accounts payable management or it can be included as another part of the financial literacy seminar for small-scale pharmacy owners.

Based on the problems encountered by the business, the researcher concludes that it is not the poor quality of medicines was the main problem of the business but the suppliers that cannot deliver on time, this is because most of the suppliers are from Metro Manila and some part of the regions. However, their top problem with their clients was not the shoplifters but the clients who do not bring their prescriptions. The researcher concludes that prescription is very important to give the right medicines, dosage, and brands that were given by the physician.

As reiterated by the researcher, Financial Management Literacy Seminars and Training are highly recommended for the small-scale pharmacy owner of the City of Cabanatuan, Philippines.

## REFERENCES

- [1] Merriam Webster <https://www.merriam-webster.com/dictionary/>
- [2] Official Gazette of the Philippines <https://www.officialgazette.gov.ph/2016/07/21/republic-act-no-10918/>
- [3] Kieth N. Herist, Brent Rollins and Matthew Perri III 2011 - Financial Analysis in Pharmacy Practice, 1 Lambeth High Street, London SE1 7JN, UK 1559 St. Paul Avenue, Gurnee, IL 60031, USA
- [4] James A. Jorgenson, RPh, MS, FASHP (2013); The Business of Pharmacy: A Prescription for Change Copyright Pharmacy Times 2006-2019 Pharmacy & Healthcare Communications, LLC. All Rights Reserved
- [5] Food and Drug Administration Circular No. 2014 – 025: Guidelines on the Implementation of New Rules and Regulations and the Licensing of Drugstore/Pharmacy/Botica and Similar Outlets following Administrative Order No. 2014-0034, dated October 13, 2014;
- [6] Kanya February 1, 2019, The Importance of Accounting Software for Businesses, How to Manage Accounts Payable Aging Reports
- [7] Dennis Najjar, July 11, 2019 The Balance Small Business
- [8] Guthman and Dougal, smriti chad, Financial Management: it's Definition, Meaning and Objectives– Discussed! <https://www.yourarticlelibrary.com/>
- [9] Samuel Tabot, The accounts payable management practices of small, medium and micro enterprises in the Cape Metropolis. <https://www.researchgate.net/>
- [10] Varun Mehta, 7 September, 2018, London school of business and finance