The Concept of Islamic Smart City in Urban Regional Planning in Sinjai Regency

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***Abstract*— Sinjai City has started implementing the smart city concept as an alternative in solving various city problems. The readiness of the government and citizens to synergize with each other in supporting the Smart City concept. The successful implementation of this concept is not only influenced by the latest technology but also needs to apply local wisdom values that have long grown and rooted in the joints of society. The synergy of technology and local wisdom values will have a positive impact on the sustainability of the city. For this reason, this study aims to determine and describe the synergy of applying local wisdom values in order to realize the concept of Islamic Smart City in Sinjai Regency. Researchers used a qualitative method with a descriptive approach in collecting and analyzing related data and to analyze planning strategies with SWOT analysis tools. The results showed that the smart city concept generally has a positive impact on the government and society. Sinjai City, whose success needs the support of various parties in applying the synergy of technology and Islamic local wisdom values. The results of the SWOT analysis concluded that the six smart city variables (smart governance, smart economy, smart branding, smart society, smart living, smart environment) use a strategy (strengths opportunity) in quadrant one, which maximizes internal strengths to capture opportunities to support smart city programs to realize Sinjai City as an Islamic smart city.**

Keywords—Sinjai; Islamic; Smart City; SWOT

I. INTRODUCTION

According to PBB estimates, by 2050, 66% of the world's population will live in urban areas [1][2][3], posing major challenges related to air pollution, congestion, waste management, and human health [4][5][4]. As the European Union and the United Nations have set ambitious climate and energy targets for the coming years [6][7], there is an urgent need to develop smart solutions to address the challenges of urbanization [5], [8].

Realizing smart cities on the basis that cities in Indonesia are used as centers and urbanization magnets so that they experience an increase in population growth from year to year, both from natural growth and population migration from other regions. In addition, the flow of urbanization is a problem for urban areas to be able to minimize constraints on the environment because on the other hand land resources are limited and fixed while the population is increasing [23]-[27].

Population growth cannot be matched by the availability of land which will lead to overcrowding, giving birth to slums, domestic and household waste, congestion, and also other environmental problems. Smart city innovation is an advanced development of neo-classical economic growth theory [3]. Neo-classical economic growth theory, pioneered by Robert Solow and Trevor Swan, developed since the 1950s. This theory refers to the analysis of classical theory. According to neo-classical theory, economic growth depends on the availability (supply) of factors of production (population, labor, capital accumulation) and technological progress [28]-[33].

This phenomenon encouraged the birth of the smart city concept in Indonesian cities. According to Kourtit and Nijkamp, smart cities are the result of knowledge-intensive and creative strategies that aim to improve the socio-economic, ecological, logistical, and competitive performance of cities [34], [35]. The smart city concept has attributes of each component, namely smart governance, smart economy, smart people, smart living, smart mobility, and smart environment. The smart city concept solves problems to be more effective and efficient due to the influence of population growth, which creates more complex problems.

The concept of smart city [10] in its realization must take into account wisely the elements of technology, people, and institutions. All three must be planned to be well integrated and supported by a serious commitment and involve all stakeholders in the city. The smart city concept that only prioritizes the use of technology in city management, then ignores community participation in the city development process will have a negative impact and can cause problems [36].

The smart city concept has gradually been implemented in Sinjai City. This can be seen from improving the quality of education and human resources or smart people, which is one of the components in the smart city concept. Another effort from the government in Sinjai Regency is the improvement of infrastructure in the implementation of government and licensing services to the community such as the ease of taking care of business licenses and other administrative requirements.

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Sinjai Regency is known as one of the districts in Indonesia that has strong religious values, but creativity in developing the city is carried out in harmony with local wisdom and Islamic values that exist in society. Based on the description above, the problem formulation in this study is how the synergy and strategy of implementing the Islamic Smart City concept in Sinjai Regency.

II. RESEARCH METHODS

Big data technology is an important element supporting the realization of the smart city concept [37]. This technology enables efficient data storage and processing to generate information that can improve the various services needed by a smart city. Big data technology can also be used as a consideration in analyzing the market for public service satisfaction responses submitted by citizens through social media, whose data processing is collected through hastags or from other data analysis results.

The research used is descriptive research through a quantitative approach [38] in conducting a literature review related to the application of the smart city concept in several cities in Indonesia and making it a reference in understanding the application of the Islamic smart city concept in Sinjai City. Literature review data comes from official government documents, research reports, journal articles and other sources from various trusted media. While descriptive research is research to assess variables without assessing comparisons and connecting with other variables [39]. The quantitative approach is an approach that emphasizes theory as a measure of variables that are read using numbers and statistical systematics.

The research uses primary data and secondary data. Primary data is data obtained directly by researchers in the field either from observation, documentation or in-depth interviews. Primary data is obtained by conducting interviews and distributing questionnaires. Secondary data is data without conducting surveys in the field directly but obtained by researchers through scientific works in the form of journals and articles. The research population uses Regional Apparatus Organizations (OPD), including the One-Stop Investment and Integrated Services Office, the Industry and Trade Office, the Tourism and Culture Office, the Manpower Office, the Transportation Office, the Social Service, the Environmental Service.

The sample is part of the number and characteristics of the population. Sampling technique is a sampling technique to determine the sample to be used in research, there are several sampling techniques used.

Sampling was carried out using the Slovin formula with a precision or error rate of 10% (0.1) as follows:

$$n = \frac{N}{N\,(d^2) + 1} \quad (1)$$

Notes:
N = Population size
n = Sample size
d = Precision / error rate

A. Readiness level analysis

Adjusting to the formulation of the problem that to analyze the level of readiness of Sinjai Regency in implementing the smart city concept, the weight means score analysis method is used using a Likert scale. The method provides data on the value of the level of readiness measured using indicators of each smart city variable using a questionnaire whose statements are written by the researcher.

The Likert scale has gradations of positive to negative answers. Researchers used a gradation of five (5) answers, namely very ready (5), ready (4), quite ready (3), not ready (2), very not ready (1). To calculate the interval using the highest score value (5) minus the lowest score value (1) then divided by the number of answer criteria [40].

$$\text{Interval} = \frac{\text{highest score} - \text{lowest score}}{\text{Number of answer criteria}}$$

$$\text{Interval} = \frac{5 - 1}{5}$$

Interval = 0,8

The interval value is obtained to determine the gradation of respondents' answers, as follows:
a. 1.00 - 1.80 = Very unprepared
b. 1.81 - 2.61 = Not ready
c. 2.61 - 3.41 = Moderately prepared
d. 3.41 - 4.21 = Ready
e. 4.21 - 5.00 = Very ready

Weight means score analysis is an analysis to interpret or interpret the answers of each respondent from each variable parameter. Researchers used the formula

$$M = \frac{\sum fx}{n} \quad (2)$$

Description:

M = Interpretation score
f = Frequency
x = Weighting of the value scale (score)
n = Number of respondents

The score value of each variable will be recapitulated and the total score summed up. The recapitulation results in a final score that represents the planning readiness position.

III. RESULTS AND DISCUSSION

A. Implementation of Smart City Concept in Indonesia

The idea of the smart city concept has been discussed and applied in developed countries, due to the advancement of internet technology that is rapidly developing and used in various aspects of life. Some cities in Indonesia have started to implement the concept, but have not maximized its achievements. One of the most important goals of implementing the smart city concept is for the city to provide the best services using the latest technology effectively and cheaply to all citizens. The smart city concept will run optimally if the government and the community can play an active role in supporting the availability and utilization of big data technology. However, in implementing the concept, there will be several problems that can arise, including violations of the privacy of users of data collected on one platform that is open to anyone.

In line with the use of big data technology, the Bogor City Government in implementing the smart city concept has provided a mobile-based smart city application for all complaints and complaints inputted by citizens. The input data is then analyzed and can be displayed in an easy-to-understand form so that it can be used as a reference in determining government policies. The Bogor City Government has also created the Bogor Green Room (BGR) which is a data and information center for consideration in making decisions on population, environmental and daily life issues. This also includes supporting the improvement of public services, such as monitoring transportation conditions, emergency conditions and disaster preparedness warnings.

The implementation of the smart city concept in Makassar City has also been able to monitor traffic congestion that occurs along the roads in the city through the installation of CCTV in every corner of the city that is prone to congestion. Likewise, the online parking payment system is already on the track. In addition, the Makassar City Government has also created the Makassar Smart Card which can be used for various purposes in dealing with government and payment systems. From the use of Makassar Smart Card, population data can be obtained by the government and can be categorized according to the desired target. With the use of the smart card, the government can monitor the extent of the needs of citizens, what payments are often made and what citizens always spend at a certain time, as well as what time is the choice of the community in taking care of administrative and government-related matters when using the smart card [45].

The purpose of Sinjai Regency implementing the smart city concept is to realize sustainable development by providing excellent service to its community (where the population is growing every year). The six elements of smart city in Sinjai Regency are the beginning of changes and improvements in increasing the potential of the region in achieving prosperity, welfare, competitiveness, and being able to provide protection and services for its people. Smart city has six key elements, including:

a. Smart governance
   Smart governance acts as a driver of all smart city elements. Smart governance is implemented in three governance functions, namely public policy, bureaucratic governance, and public services [46]-[48].
b. Smart branding
   Smart branding is the second most important element. The purpose of smart branding is to promote the value of a region to the public, tourists, and businesses. Smart branding is implemented in three attributes, namely tourism, business, and image [43], [45].
c. Smart economy
   Smart economy relates to the creation of a smart economic system in building the right industrial ecosystem, improving the welfare of its people, and the availability of easy and convenient transaction infrastructure [44], [50].
d. Smart living
   Smart living is related to the environment where people live with the key parameters being harmonization reflected in the residential environment in community life, commercial facilities, recreational facilities for the community, health services, and mobilization facilities by means of public/individual transportation [16], [45], [52]-[55].
e. Smart society
   Smart society is related to the interaction of society both individuals, social, and digital facilities. There is individual access to education supported by digital learning facilities, life safety assurance, and disaster risk for the community [20], [43]-[45], [56]-[58].

f. Smart environment
Smart environment describes an area in preserving its environment such as managing waste and utilizing energy for a sustainable environment so that it can support the preservation of life [2], [36], [51], [59]-[63].

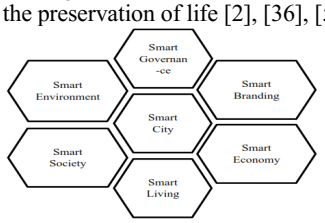

Figure 1: Smart City Components

B. Application of the Islamic Smart City Concept in Sinjai Regency

Improving the quality of services with the support of adequate infrastructure, as well as creating a comfortable environment makes socio-economic activities in Sinjai Regency more vibrant. The Smart City concept also invests in improving the quality of human resources and social capital so as to increase sustainable economic growth and quality of life (Hius, 2020).

The concept of Islamic Smart City can be a filter that filters the negative flow of global influences that affect people's thinking. The presence of Islamic local values can also bring changes in the mindset of the community in the social, economic, cultural and environmental fields, for the better.

As a city that has begun to implement the smart city concept, the Sinjai Regency government must prepare itself to fulfill several dimensions that measure its success as a smart city. These dimensions include smart economy. For this reason, it is necessary to plan a new innovation in running the sharia-based economy in Sinjai Regency, both in terms of production, distribution and exploration. Production includes how Sinjai Regency can be independent in meeting the needs of clothing, food and shelter for its people.

The second dimension element is smart mobility, which emphasizes the importance of ease of access and movement. Currently there are efforts to increase the quantity and quality of public transportation modes in Sinjai Regency by presenting public transportation modes, so the arrangement of bus routes and schedules must be reliable so that it will encourage people to want to use public transportation and reduce the use of private vehicles. Route and schedule arrangements must also be adjusted to the prayer time schedule, so that the community and managers can attend mandatory congregational prayers at any time.

Environmental elements also cannot be ignored in building a smart city. A good city must provide at least 20% of its land as public green open space that can be utilized by the public and 10% of its land as private green open space (Fuady, 2016). Regulating the beauty and cleanliness of the city is an obligation in realizing the smart environment element as part of the smart city concept. Currently, waste management in the city in Sinjai Regency is getting better where city cleaners have been evenly organized to serve almost all parts of the city (Fuady, 2016). Realizing a clean Sinjai Regency is the obligation of all community members as the advice of cleanliness is part of faith.

In order for all dimensional elements in the smart city concept to run well, the smart governance element, namely the Sinjai Regency government, must also increase its capacity in an effort to provide the best service for the citizens of Sinjai Regency. Some innovations in the field of licensing services have been carried out by the government should be appreciated.

After all the dimensions above can be fulfilled, the convenience will lead to smart living, which is a dimension that emphasizes how city residents can live comfortably and prosperously. The concept of Islamic smart city must be able to implement every citizen can worship in peace at the mosque, there is easy access to the mosque, as well as financial relief for Islamic education for children when studying at the Koranic Education Park built in each region.

The last dimension in the smart city concept is smart society. A good policy made by the government becomes useless if the community does not want to change for the better. The principles of hedonism and individualism are challenges that must be overcome by the citizens of Sinjai Regency. The formation of a social community that has a level of concern for others will form a bond of friendship that is useful as a form of reminding each other of goodness will make the citizens of Sinjai Regency as Islamic smart people.

C. Readiness Level Analysis

Analysis of smart governance readiness. Based on the calculation of the recapitulation of respondents' answers using the radar chart, it is known that the value of the ICT usage indicator and the availability of facilities are above the average value of 4.05 as a (relative) baseline and fall into the ready category while the participation and human resource indicators are below the average value, transparency is equal to the average value.

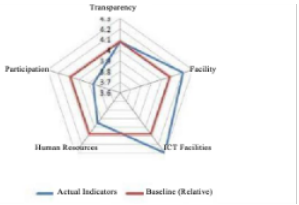

Figure 2. Analysis of smart governance readiness level

The five indicators that excel in readiness are the use of ICT and the availability of facilities compared to the other indicators (see Figure 2).

Analysis of smart economy readiness.Based on the calculation of the recapitulation of respondents' answers using a radar chart, it is known that the indicator values of the number of SMEs, training, ICT, database availability, exports are above the average value of 3.83 as a (relative) baseline and fall into the ready category while the trademark and capital assistance indicators are below the average value. The seven indicators that excel in readiness are the number of SMEs, training, ICT, database availability, and exports compared to other indicators (see Figure 3).

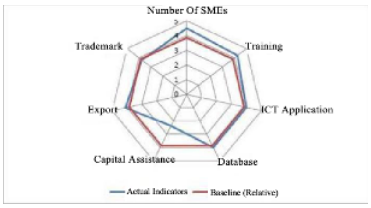

Figure 3. Analysis of smart economy readiness level

Analysis of smart branding readiness. Based on the calculation of the recapitulation of respondents' answers using a radar chart, it is known that the value of the local product, art, and tourism promotion indicators is above the average value of 3.56 as a (relative) baseline and is in the ready category while the facility and access availability indicators are below the average value. The five indicators that excel in readiness are indicators of local products, arts, and tourism promotion compared to other indicators (Figure 4).

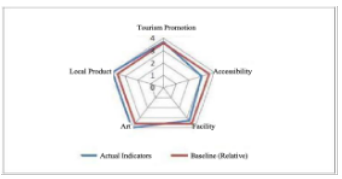

Figure 4. Analysis of smart branding readiness level

Analysis of smart living readiness. Based on the calculation of the recapitulation of respondents' answers using the radar chart, it is known that the value of the traffic light indicator, traffic monitors, and information availability are above the average value of 4.44 as a (relative) baseline and fall into the very ready category while the indicators of easy access to transportation, transportation availability, smart transportation systems, transportation tariffs, and transportation monitoring systems are below the average value. The eight indicators that excel in readiness are the traffic light, traffic monitoring, and information availability indicators compared to the other indicators (Figure 5).

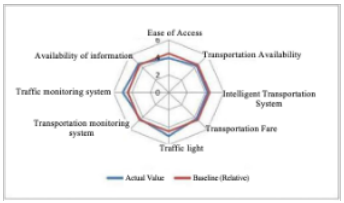

Figure 5. Analysis of smart living readiness level

Analysis of smart society readiness. Based on the calculation of the recapitulation of respondents' answers using the radar chart, it is known that the value of the Educated Society indicator, interest in learning is above the average value of 3.45 as a (relative) baseline and falls into the ready category while the indicators of openness to change, protection services, availability of institutions, and access services are below the average value. Of the six indicators, the ones that excel in readiness are the educated community and interest in learning indicators compared to the other indicators (Figure 6).

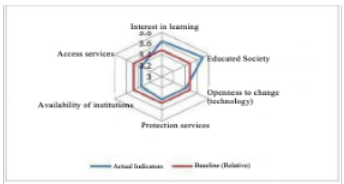

Figure 6. Analysis of smart society readiness level

Analysis of smart environment readiness. Based on the calculation of the recapitulation of respondents' answers using a radar chart, it is known that the indicator values of green space availability, air pollution protection, water pollution protection, 3R program, landfill capacity are above the average value of 3.36 as a (relative) baseline and fall into the category of quite ready while the use of ICT is equal to the average value of 3.36. Indicators of environmental protection by involving IT, renewable energy, and socialization are below the average value (Figure 7).

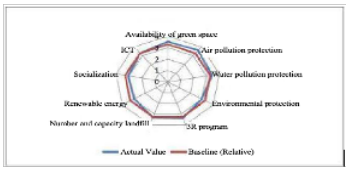

Figure 7. Analysis of smart environment readiness level

Analysis of smart city readiness. Sinjai Regency is seen on 6 smart city programs, namely smart governance, smart economy, smart branding, smart living, smart society, and smart (Figure 8).

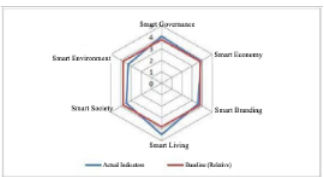

Figure 8. Readiness level of 6 smart city components Sinjai District

D. SWOT Analysis

This research uses SWOT analysis to determine regional planning strategies as input and correction for the government in pursuing the smart city concept in Sinjai Regency. In this research, the SWOT analysis technique is an extension of the readiness level analysis. When the readiness level value appears, the researcher determines the planning strategy to support readiness and realize the smart city of Sinjai Regency.

The results of the analysis of the SWOT smart governance. There are six strategies, namely:

a) Provide online service education through socialization at the PTSP Office

b) Conduct training through technical guidance
c) Provide a special complaint media so that people who complain about services do not go back and forth to the office
d) Optimizing manual information about the importance of online facilities and slipping information about smart cities.
e) Optimizing the use of websites and social media to update service information.
f) Improving services through the OSS system to make the community more effective and efficient

The results of the analysis of the SWOT smart economy matrix, there are for strategies, namely:

a) Conduct marketing socialization by utilizing social media so that the export share is wider
b) Collaborate with industry owners to market products.
c) Establish a creative economy area center.
d) Optimizing the use of the internet so that people are accustomed to looking for information and adding insight into business and industrial establishment.

The results of the analysis of the SWOT smart branding matrix, there are four strategies, namely:

a) Create a package of tourist collections in Sinjai Regency in the form of videos and documentation to be introduced through brand selling mission cooperation.
b) Establish cultural heritage to attract the interest of local communities
c) Create an annual calendar of events, both large and small events and publish them through social media and the Sinjai Regency website
d) Showcasing Sinjai Regency products through organized events while providing travel services according to the planned route.

The results of the smart living with five planning strategies, as follows:

a) Maximize guarding through CCTV and giving warnings through voice to monitor traffic regulations.
b) Maximize CCTV monitoring for orderly road users.
c) Improve transportation and road comfort so that people reduce the use of private transportation.
d) Provide travel information and appeals through road sections and intersections as traffic stopping points.
e) Improve regulations and sanctions for violating road users.

The results of the smart society. These planning strategies include:

a) Optimize technical guidance training regularly.
b) Conduct valid data collection to avoid social jealousy
c) Provide assistance in the form of education and creativity for interest in going to school
d) Improve information data on beneficiaries
e) Optimizing the use of online services
f) Coordinate with health services to provide assistance for children who are stunted

The results of the SWOT smart environment. These planning strategies include:

a) Establish a cooperative relationship between community groups, agencies, and companies providing assistance through CSR.
b) Maximize the use of online complaints to assist with slum problems reported by the Community.
c) Create a counseling and socialization program to villages and cities that pay less attention to waste.
d) Conduct educational counseling on the use of waste as a substitute energy (renewable).
e) Debriefing through organic and non-organic waste creativity.

IV. CONCLUSIONS

The smart city concept has become a hopeful solution to various urban problems in Indonesia. This concept is applied with the aim of providing more effective and efficient public services through technological innovation. However, in its application, the smart city concept must synergize with local wisdom values (Islamic Smart City) in order to achieve ideal results as intended. Based on the results of the weight means score analysis related to the calculation of the level of readiness, it is concluded that 6 smart city elements are categorized as ready but of the six elements there are three superior elements (smart governance, smart economy, and smart living). SWOT analysis concluded that the six dimensions of smart city have an S-O planning strategy, which is a strategy that emphasizes the strengths possessed to capture existing opportunities.

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