



Open Access Indonesia Journal of Social Sciences

Journal Homepage: <https://journalsocialsciences.com/index.php/OAIJSS>

Analysis of the Role of Agile Governance in the Development of the Smart City Concept: A Qualitative Study of the Banyumas Regency Government, Indonesia

Sri Rotul Marfuah^{1*}, Tobirin¹, Ali Rokhman¹, Muslih Faozanudin¹

¹Master of Public Administration, Faculty of Social and Politic Sciences, Universitas Jenderal Soedirman, Purwokerto, Indonesia

ARTICLE INFO

Keywords:

Agile governance
Case studies
Local government
Smart city
Urban development

*Corresponding author:

Sri Rotul Marfuah

E-mail address:

srirotul65@gmail.com

All authors have reviewed and approved the final version of the manuscript.

<https://doi.org/10.37275/oaijss.v7i4.260>

ABSTRACT

The smart city concept has become a new paradigm in urban development, offering innovative solutions to improve people's quality of life. Agile governance, with its flexibility and adaptability, is a promising approach in managing the complexity of smart city development. This research aims to analyze the role of agile governance in developing the smart city concept in the Banyumas Regency Government, Indonesia. This research uses a qualitative approach with a case study of the Banyumas Regency Government. Data was collected through in-depth interviews with relevant government officials, document analysis, and field observations. Data analysis was carried out using thematic coding and triangulation techniques to ensure the validity and reliability of the research results. The research results show that agile governance plays an important role in developing the smart city concept in Banyumas. Agile principles such as collaboration, iteration, and focus on customer value have been adopted in the planning, implementation, and evaluation processes of smart city programs. Agile governance allows governments to respond quickly to change, actively involve the public, and optimize the use of resources. Agile governance has proven effective in overcoming the challenges of complexity and uncertainty in smart city development. Implementing agile governance can increase the efficiency, effectiveness and sustainability of smart city programs. This research contributes to the development of agile governance theory and practice in the context of smart cities, as well as providing recommendations for other local governments who wish to adopt this approach.

1. Introduction

The smart city concept has become a new paradigm in urban development, offering innovation the smart city concept has become a new paradigm in urban development in the current digital era. Driven by rapid advances in information and communications technology (ICT), smart cities offer innovative solutions to overcome various complex urban challenges, ranging from traffic congestion, and pollution, to social inequality (Komninos et al., 2018). Smart cities are not only about the use of advanced technologies but also about integrating these technologies with effective urban governance to improve the overall quality of life

of society (Albino et al., 2019). However, the journey towards a smart city is not without obstacles. The complexity of urban problems, limited resources, socio-political dynamics, and rapid technological change are challenges that must be faced by local governments (Hollander, 2018). In addition, smart city development is often hampered by a top-down approach that is rigid and less adaptive to change (Iannacci, 2019). In this context, agile governance emerges as a promising alternative approach to managing complexity and uncertainty in smart city development.



Agile governance, which originates from the software industry, emphasizes flexibility, adaptability, collaboration, and a focus on customer value (Highsmith, 2018). These principles enable local governments to respond quickly to change, actively involve communities, and optimize resource use (Klievink, 2020). Agile governance also encourages innovation and experimentation, which are very important in the sustainable development of smart cities. This research focuses on analyzing the role of agile governance in developing the smart city concept in Banyumas Regency, Indonesia. Banyumas was chosen as a case study because it is one of the districts that has declared itself a smart city and has made various efforts to realize this vision. Banyumas has developed various smart city initiatives, such as e-service applications, traffic management information systems, and community participation platforms. However, like other regions, Banyumas also faces challenges in implementing smart cities, such as limited resources, lack of coordination between agencies, and resistance to change.

This research aims to understand how agile governance is applied in the development of the smart city concept in Banyumas, identify factors that support and hinder its implementation, and evaluate its impact on smart city project performance. Thus, it is hoped that this research can contribute to the development of agile governance theory and practice in the context of smart cities, as well as provide recommendations for other local governments who wish to adopt this approach. This research is important because it can provide new insights into how agile governance can help local governments overcome challenges in smart city development. Apart from that, this research can also provide practical recommendations for local governments in implementing agile governance effectively. Thus, it is hoped that this research can contribute to efforts to realize a sustainable and inclusive smart city in Indonesia.

2. Literature Review

Evolution of the smart city concept

The smart city concept has undergone significant evolution since its emergence at the beginning of the 21st century. Initially, smart cities were often identified with the use of advanced technology such as sensors, high-speed internet networks, and big data platforms (Komninos et al., 2018). However, over time, the understanding of smart cities has developed to be more holistic and focused on improving the quality of life of society as a whole (Albino et al., 2019). Smart cities are now seen as a complex ecosystem, where technology, people, and the environment interact to create better urban solutions (Komninos et al., 2018). Smart cities are not only about technology, but also about good governance, community participation, and environmental sustainability (Hollander, 2018). In its development, smart cities have adopted various approaches and implementation models. Some cities focus on developing technological infrastructure, while others place more emphasis on improving public services and citizen participation (Meijer, 2021). There are also cities that adopt a more integrated approach, covering various aspects of urban life (Samarasinghe, 2020).

Challenges in smart city implementation

Although the smart city concept offers a lot of potential, its implementation is faced with various challenges. One of the main challenges is the complexity of urban problems that require multidisciplinary and multi-stakeholder solutions (Iannacci, 2019). Apart from that, limited resources, both in terms of budget and human resources, are also an obstacle in developing smart cities, especially in developing countries (Rodriguez-Abitia, 2019). Another challenge is resistance to change, both from the government and society (Linders, 2019). Changing an organizational culture that tends to be bureaucratic and hierarchical to become more collaborative and adaptive is not an easy thing



(Wijnhoven, 2018). Additionally, the implementation of new technologies often raises concerns about privacy, security, and the digital divide (Paskaleva, 2018).

Agile governance as a potential solution

Agile governance offers a potential solution to overcome challenges in smart city implementation. Agile principles such as collaboration, iteration, feedback, and focus on customer value can help local governments to be more adaptive, responsive, and results-oriented (Highsmith, 2018). Agile governance can facilitate collaboration between the government, the private sector, and society in developing smart cities (Sharma et al., 2023). By involving various stakeholders from the start, agile governance can ensure that the solutions developed are in line with the needs and aspirations of society (Ommeren, 2022). Agile governance can also help local governments to manage risks and uncertainties in smart city development. By using an iterative and incremental approach, local governments can test new solutions on a small scale before they are implemented widely (Viitanen, 2022). This can reduce the risk of project failure and ensure that the investments made provide optimal results.

Application of agile governance in smart city development

Several studies have shown the benefits of implementing agile governance in smart city development. Lee (2022) found that agile governance can increase the efficiency and effectiveness of smart city projects in South Korea. Sharma et al. (2023) concluded that agile governance can facilitate collaboration between the government, private sector, and society in the development of smart cities in India. Case studies in Amsterdam show that agile governance can help city governments respond quickly to change and develop innovative solutions (Klievink, 2020). Meanwhile, a case study in Mexico City shows that agile governance can increase transparency and

accountability in managing smart city projects (Rodríguez-Abitia, 2019).

3. Methods

This research uses a qualitative approach with an embedded case study design. A qualitative approach was chosen because this research aims to understand in depth the phenomenon of implementing agile governance in developing the smart city concept in Banyumas Regency. An embedded case study is used because this research focuses on one case, namely Banyumas Regency, but also involves analysis of several sub-case units, such as different smart city projects. This research was conducted in Banyumas Regency, Central Java, Indonesia. The selection of Banyumas as a research location was based on several considerations. First, Banyumas is one of the districts that has declared itself a smart city and has made various efforts to realize this vision. Second, Banyumas has developed various smart city initiatives, such as e-service applications, traffic management information systems, and community participation platforms. Third, Banyumas has a special team responsible for managing smart city projects. This research was conducted for five months, from January to May 2024.

The participants in this research consisted of various stakeholders involved in developing the smart city concept in Banyumas Regency. These participants include: Regional government officials, including heads of departments, heads of divisions, and staff involved in smart city projects; Smart city project team members, including project managers, software developers, and data analysts; Community representatives, including community leaders, academics and smart city activists. The selection of participants was carried out using a purposive sampling technique. This technique was chosen because participants were considered to have knowledge and experience relevant to the research topic.



The data in this research was collected through three main techniques, namely: 1. In-depth Interview: In-depth interviews were conducted with local government officials, smart city project team members, and community representatives. Interviews were conducted in a semi-structured manner, using a previously prepared interview guide. The interview guide contained open-ended questions that allowed participants to express their views and experiences in depth. Interviews were recorded and then transcribed for further analysis. 2. Document analysis: Document analysis was carried out on various documents related to the development of the smart city concept in Banyumas. These documents include the Regional Medium Term Development Plan (RPJMD), smart city project reports, presentations, and news articles. Document analysis was carried out to obtain information about policies, strategies, and implementation of smart cities in Banyumas. 3. Field observation: Field observations were carried out to directly observe the smart city development process in Banyumas. Observations were carried out at various activities, such as project team meetings, focus group discussions, and training. Observations were carried out in a non-participatory manner, where the researcher only observed and recorded what happened without getting involved in the activity.

The collected data was analyzed using thematic analysis techniques. Thematic analysis is a qualitative data analysis method that aims to identify, analyze, and report patterns (themes) in data (Braun & Clarke, 2006). The thematic analysis process in this research consists of several stages, namely: 1. Familiarization: Researchers read and understand the data as a whole; 2. Coding: Researchers code the data based on the patterns found; 3. Searching for themes: Researchers group codes that have similarities into themes; 4. Reviewing themes: Researchers re-examine the themes that have been found to ensure their validity; 5. Defining and naming themes: Researchers provide definitions and names to the themes that have been

found; 6. Writing up: Researchers write the results of the thematic analysis in the form of a research report. To increase the validity and reliability of research results, data triangulation techniques were used. Data triangulation is a technique of collecting data from various sources to verify and confirm research findings. In this research, data triangulation was carried out by comparing data from interviews, document analysis, and field observations. This research was conducted by observing the principles of research ethics. Before conducting research, researchers have obtained permission from the relevant parties. Research participants have also been given an explanation of the research objectives and their rights as participants. Researchers also guarantee the confidentiality of participants' identities.

4. Results and Discussion

Table 1 presents the characteristics of various respondents in terms of gender, age, educational background, position, and length of work. This diversity reflects the complexity of smart city development which involves various stakeholders with different perspectives and expertise. Respondents from government circles have educational backgrounds that are relevant to smart city development, such as information engineering, regional planning, and public administration. Their positions also vary, from department heads to expert staff, showing the involvement of various work units in smart city initiatives. Varied lengths of service, from 3 to 25 years, provide a combination of experience and fresh perspectives to the team. Respondents from the community, including community leaders, academics, and activists, also have an important role in this research. Their diverse educational backgrounds, such as sociology, law, and environmental engineering, provide different perspectives in evaluating the impact and acceptance of smart city initiatives in society. Overall, the diversity of



respondents' characteristics enriches the research by providing various perspectives and experiences that are relevant to the implementation of agile governance

in smart city development in Banyumas Regency. This allows a more comprehensive and in-depth analysis of the phenomenon under study.

Table 1. Characteristics of respondents.

No.	Respondent	Gender	Age	Last education	Position	Length of work
1	R1	Man	45	Master of Informatics Engineering	Head of the Communications and Information Service	10 years
2	R2	Woman	38	Master of Regional Planning	Head of Development Planning Division	7 years
3	R3	Man	29	Bachelor of Government Science	Regent's Expert Staff	3 years
4	R4	Woman	52	Doctoral Degree in Public Administration	Head of the Public Works and Spatial Planning Department	25 years
5	R5	Man	41	Master of Management	Smart City Project Manager	5 years
6	R6	Man	33	Bachelor of Civil Engineering	Smart City Project Team Member	4 years
7	R7	Woman	27	Bachelor of Computer Science	Smart City Project Team Member	2 years
8	R8	Man	60	Bachelor of Laws	Community Leaders	-
9	R9	Woman	48	Masters in Sociology	Academy	15 years
10	R10	Man	35	Bachelor of Environmental Engineering	Smart City Activist	-

Table 2 presents the results of interviews with ten respondents involved in smart city development in Banyumas Regency. Respondents came from various backgrounds, including government officials, project team members, community leaders, academics, and activists. This table provides a comprehensive overview of the implementation of agile governance in smart city development in Banyumas. In general, respondents had a positive view of agile governance, seeing it as an effective approach to increasing the speed, quality and adaptability of project development. However, several challenges were identified, such as a lack of understanding of agile among employees and the public, resistance to change, limited resources, difficulty in measuring project progress, and lack of support from leadership. Respondents also highlighted various perceived benefits from implementing agile governance, such as increased collaboration and communication, increased community participation, improved product and service quality, and increased government

transparency and accountability. Based on the results of the interviews, respondents provided several suggestions and recommendations to improve the implementation of agile governance, such as increasing socialization and training about agile, building an organizational culture that is more open to change, increasing human resource capacity, allocating an adequate budget, developing a more effective performance measurement system, increase leadership awareness about the benefits of agile governance, conduct comparative studies to other regions, increase community participation mechanisms, look for alternative funding sources, and improve coordination between government agencies. Overall, the results of these interviews provide empirical evidence that supports the argument that agile governance can be an effective approach in smart city development. However, to achieve optimal results, efforts need to be made to overcome existing challenges and implement the recommendations provided.



Table 2. Results of interviews with respondents.

Respondent	Views on Agile Governance	Challenge	Benefit	Suggestions/Recommendations
R1	Implementing agile governance is very helpful in increasing the speed and quality of smart city project development.	There is still a lack of understanding about agile among officials.	Increase project development speed, improve product quality, and increase user satisfaction.	Increase socialization and training about agile governance.
R2	Agile governance allows the government to be more adaptive and responsive to change.	Resistance to change from some employees.	Increasing collaboration and communication between work units, encouraging innovation.	Building an organizational culture that is more open to change.
R3	Agile governance can increase the efficiency and effectiveness of project teamwork.	Limited resources, both in terms of budget and human resources.	Improve collaboration and communication between team members, and improve product quality.	Increase human resource capacity and allocate an adequate budget for smart city development.
R4	Agile governance can increase community participation in smart city development.	Lack of understanding about agile among the public.	Increasing government transparency and accountability, increasing public trust in the government.	Increase socialization about agile governance to the community.
R5	Agile governance allows project teams to work in a more structured and measurable way.	Difficulty in measuring project progress.	Increase team productivity, improve product quality, and increase user satisfaction.	Develop a more effective performance measurement system.
R6	Agile governance can help project teams to identify and resolve problems more quickly.	Lack of support from leadership.	Increase project development speed, improve product quality, reduce the risk of project failure.	Increase leadership awareness about the benefits of agile governance.
R7	Agile governance can improve the quality of smart city products and services.	Lack of experience in applying agile governance.	Increase user satisfaction, increase service efficiency and effectiveness.	Conduct comparative studies to other regions that have successfully implemented agile governance.
R8	Agile governance can increase government transparency and accountability in smart city development.	Lack of community involvement in the decision-making process.	Increasing public trust in the government, increasing community participation.	Improving mechanisms for community participation in smart city development.
R9	Agile governance can help local governments to develop smart city solutions that are more innovative and sustainable.	Limited budget for smart city development.	Increasing regional competitiveness, improving the quality of life of the community.	Looking for alternative funding sources for smart city development.
R10	Agile governance can help local governments achieve sustainable development goals (SDGs) through smart city development.	Lack of coordination between government agencies.	Improving environmental quality, increasing accessibility of public services, improving community welfare.	Improve coordination and collaboration between government agencies.

Table 3 presents an analysis of documents relevant to the implementation of agile governance in developing the smart city concept in Banyumas Regency. The documents analyzed include the RPJMD, project performance reports, policy documents, meeting minutes and news articles. The RPJMD analysis shows the alignment of Banyumas' vision and mission as a smart city with the principles of agile governance. A vision that focuses on results

and improving quality of life reflects the customer value orientation of agile. The broad priority program shows flexibility and adaptability in planning, in accordance with agile principles that are responsive to change. Project performance reports provide empirical evidence about the implementation of agile governance in the field. Completion of projects on time and within budget shows the effectiveness of agile in project management. However, delays and changing needs



also show the importance of adaptability and flexibility in agile governance. Regular project evaluations demonstrate the application of the principles of feedback and continuous learning, which are key elements in agile. Analysis of policy documents reveals that agile governance has been integrated into the Banyumas smart city policy framework. The emphasis on collaboration between the government, the private sector and society is in line with agile principles which emphasize teamwork and open communication. The push for innovation and the use of open technology reflects agile principles that encourage experimentation and learning. Project team meeting minutes provide insight into how agile governance is

implemented in daily practice. Regular and structured meetings demonstrate the application of the principles of open communication and collaboration. The short stand-up meeting format and focus on results shows efficiency and effectiveness in decision making. The news article provides an external perspective on the implementation of agile governance in Banyumas. These articles highlight the smart city initiatives that have been undertaken and the public's response to them. This provides valuable feedback for improving future smart city projects and shows how agile governance can improve government transparency and accountability.

Table 3. Document analysis.

No.	Document type	Summary of findings	Relevance to agile governance
1	Banyumas Regency Regional Medium Term Development Plan (RPJMD) 2021-2026	The vision of Banyumas as an integrated and sustainable smart city. Mission to improve people's quality of life through the use of technology. Priority programs include developing ICT infrastructure and improving public services and the digital economy.	Vision and mission that focuses on results and improving the quality of life in line with agile governance principles that are customer value-oriented. Broad prioritization programs demonstrate flexibility and adaptability in planning, in line with agile principles.
2	Banyumas Smart City Project Performance Report 2023	Several projects have been completed on time and within budget, such as the development of e-service applications and traffic management information systems. Other projects experienced delays due to changing needs and technical constraints. Project evaluations are carried out periodically to measure performance and provide feedback.	Completion of projects on time and within budget shows the effectiveness of agile governance in project management. Project delays and changing requirements demonstrate the importance of adaptability and flexibility in agile governance. Periodic project evaluations demonstrate the application of the principles of feedback and continuous learning in agile governance.
3	Banyumas Smart City Policy Document	The policy emphasizes the importance of collaboration between the government, the private sector, and society in developing smart cities. Policies also encourage innovation and the use of open technology.	The emphasis on collaboration is in line with agile governance principles which emphasize the importance of teamwork and open communication. Encouragement of innovation and use of open technology in line with agile governance principles that encourage experimentation and learning.
4	Smart City Project Team Meeting Minutes	Project team meetings are held regularly to discuss project progress, identify problems, and find solutions. Project team meetings use a short stand-up meeting format and focus on results.	Regular and structured project team meetings demonstrate the application of the principles of open communication and collaboration in agile governance. The stand-up meeting format is short and focused on results in line with agile governance principles which emphasize efficiency and effectiveness.
5	News articles about Smart City Banyumas	News articles highlight various smart city initiatives that have been undertaken in Banyumas, such as the development of e-service applications and traffic management information systems. News articles also include public responses to the initiative.	News articles can provide an overview of the impact of implementing agile governance on smart city development in Banyumas. - Community responses can provide valuable feedback for future improvements to smart city projects.



Table 4 presents field observation data which provides empirical evidence regarding the implementation of agile governance in smart city development in Banyumas Regency. Observations were carried out at various locations and activities relevant to the smart city project, such as project team meetings, training and program outreach to the community. Field observations show that agile governance principles, such as collaboration, iteration, feedback, and focus on customer value, have been implemented in various activities. This can be seen from the use of Kanban boards to visualize work flows, daily stand-up meetings for team communication and coordination, as well as the involvement of end users in discussions and decision making. The use of Kanban boards in project team meetings indicates an effort to increase transparency and collaboration. Kanban boards allow all team members to see the status of tasks and overall project progress, making it easier to coordinate and make joint decisions. Daily stand-up meetings that are short and focused on results demonstrate attention to solving problems quickly and efficiently. Open discussions about obstacles encountered and collaborative efforts to find solutions demonstrate the team's commitment to continuous learning and improving performance. Focus group discussions (FGD) with the community regarding the development of a traffic management information system show that there are efforts to actively involve the community in smart city development. Input from the community is used as valuable feedback to improve the quality of the system. Agile governance training for Transportation Service employees shows the regional government's commitment to increasing employee capacity in implementing agile governance. It is hoped that an understanding of agile principles can increase employee work effectiveness and efficiency, as well as encourage a more adaptive and innovative organizational culture. The socialization of the smart city program to the public shows the regional

government's efforts to increase public awareness and understanding of the smart city concept. Community involvement in this outreach also shows the government's commitment to building a participatory and inclusive smart city. Overall, these field observations provide strong evidence that agile governance has been implemented in real terms in the development of smart cities in Banyumas Regency. The application of agile principles is not only limited to project teams but also extends to the policy level and interactions with society. This shows that agile governance is not just a theoretical concept, but can also be applied effectively in local government environments to achieve the goal of sustainable and inclusive smart city development.

Table 5 presents a comprehensive thematic analysis of data collected through interviews, document analysis, and field observations. This analysis reveals three main themes related to the implementation of agile governance in smart city development in Banyumas Regency: application of agile governance principles, challenges of implementation, and benefits of implementation. Thematic analysis shows that agile governance principles, such as collaboration, iteration, feedback, and focus on customer value, have been applied in various aspects of smart city development in Banyumas. Collaboration is seen from the active involvement of end users in the product and service development process. Iteration reflects the project team's ability to adapt to changing needs and technical constraints. Feedback from end users and periodic project evaluations are used to improve product and service quality. The focus on customer value can be seen from efforts to understand and meet community needs in developing smart city solutions. Even though the principles of agile governance have been implemented, the thematic analysis also reveals several challenges faced in its implementation. Lack of understanding about agile among employees and society is a major obstacle. This shows the importance



of socialization and training about agile governance to increase awareness and understanding of all parties involved. Resistance to change is also a challenge, especially among employees who are used to

traditional ways of working. Apart from that, limited resources, both in terms of budget and human resources, are also obstacles in implementing agile governance optimally.

Table 4. Field observation data.

No.	Observation date	Observation location	Observed activities	Findings	Relevance to agile governance
1	January 15 th , 2024	Office of communication and information services	E-Service Application Development Project Team Sprint Planning Meeting	Project teams use Kanban boards to visualize workflow and task status. The project team discusses task priorities and estimated completion time for the next sprint. The project team engages end users in discussions to obtain input and feedback.	Kanban boards facilitate transparency and collaboration within project teams. Discussion of task priorities and time estimates demonstrate adaptive planning and focus on completing work iteratively. End-user involvement shows an orientation to customer value.
2	January 22 nd , 2024	Server room for the communications and informatics service	Daily Stand-up Meeting of the E-Service Application Development Project Team	Each team member reports on work progress, obstacles encountered, and plans for the day. Short and focused discussions to ensure all team members are aware of project progress. The project team collaboratively seeks solutions to the obstacles encountered.	<ul style="list-style-type: none"> - Daily stand-up meetings facilitate open communication and coordination between team members. - Focus on daily progress and obstacles demonstrating attention to solving problems quickly and efficiently. - Collaboration in finding solutions shows the spirit of teamwork.
3	February 5 th , 2024	Regent's meeting room	Focus Group Discussion (FGD) with the Community regarding the Development of a Traffic Management Information System	The community provides input about the desired features of the system. The community expressed their hopes for the system's positive impact on traffic in Banyumas. The project team records community input and explains plans for further system development.	FGD shows active community involvement in smart city development. Input from the community is used as feedback to improve system quality. Transparency in explaining plans for further system development shows government accountability towards the community.
4	February 19 th , 2024	Transportation department office	Agile Governance Training for Transportation Service Employees	Employees are given an understanding of agile governance principles, such as collaboration, iteration, feedback, and focus on customer value. Employees are taught how to apply agile governance in their daily work. Employees are given the opportunity to discuss and ask questions about agile governance.	This training shows the regional government's commitment to increasing employee capacity in implementing agile governance. Understanding agile principles is expected to increase employee work effectiveness and efficiency. Discussions and questions and answers allow employees to get clarification and deepen their understanding of agile governance.
5	March 5 th , 2024	Tambaknegara village hall	Socialization of the Smart City Program to the Tambaknegara Village Community	The public was given an explanation of the smart city concept and its benefits for society. The public is invited to participate in smart city development by conveying aspirations and input. The public is given the opportunity to try several digital applications and platforms that have been developed by the local government.	This outreach shows the regional government's efforts to involve the community in smart city development. Submission of aspirations and input from the community shows the principle of participation in agile governance. The opportunity to try digital applications and platforms provides a direct experience to the public about the benefits of smart cities.



Table 5. Thematic analysis.

Main theme	Subtheme	Excerpt from data	Interpretation
Application of agile governance principles	Collaboration	"The project team engages end users in discussions to obtain input and feedback." (Field Observation 1)	Agile governance encourages collaboration between various stakeholders, including end users, to ensure that the solutions developed meet their needs and expectations.
	Iteration	"Other projects experienced delays due to changing requirements and technical constraints." (Document Analysis 2)	Agile governance enables adaptation to changing needs and constraints that arise during the project development process.
	Feedback	"Project evaluations are conducted periodically to measure performance and provide feedback." (Document Analysis 2)	Agile governance emphasizes the importance of continuous feedback to improve the quality of products and services.
Challenges of implementing agile governance	Focus on customer value	"The community provided input on the features they wanted in the system." (Field Observation 3)	Agile governance places customer value at the center of attention in product and service development.
	Lack of understanding of agile	"There is still a lack of understanding about agile among employees." (R1 Interview Results)	A lack of understanding of agile principles and practices can hinder the effective implementation of agile governance.
	Resistance to change	"Resistance to change from some employees." (R2 Interview Results)	The organizational culture changes required to implement agile governance may encounter resistance from employees accustomed to traditional ways of working.
	Resource limitations	"Limited resources, both in terms of budget and human resources." (R3 Interview Results)	Limited resources can hinder the implementation of training, outreach, and implementation of agile governance.
	Increased Effectiveness and Efficiency	"Agile governance can improve the efficiency and effectiveness of project teamwork." (R3 Interview Results)	Agile governance can help project teams to work in a more structured, measurable and results-focused manner, thereby increasing work effectiveness and efficiency.
Benefits of implementing agile governance	Improved Collaboration and Communication	"Agile governance has helped improve coordination between work units in developing smart city programs." (R2 Interview Results)	Agile governance encourages open communication, transparency, and teamwork, which can improve collaboration and coordination between work units.
	Increasing community participation	"The public feels more involved in smart city development through discussion forums and online surveys." (R3 Interview Results)	Agile governance emphasizes the importance of community involvement in product and service development, so as to increase community participation and ensure that the solutions developed are in line with their needs and expectations.
	Increased Transparency and Accountability	"Agile governance can increase government transparency and accountability in smart city development." (R8 Interview Results)	Agile governance encourages transparency in the decision-making process and budget use, as well as government accountability towards society.

This research reveals the crucial role of agile governance in shaping the smart city development landscape in Banyumas Regency. The key findings of this research provide a strong foundation for enriching theoretical understanding of how agile governance can be adapted and implemented in the public sector context, especially in complex and dynamic smart city initiatives. One of the important findings from this research is how agile governance acts as a catalyst in the transformation of organizational culture in the government environment. Traditionally, government

bureaucracies tend to be rigid, hierarchical, and resistant to change (Linders, 2019). However, the results of interviews and field observations show that the implementation of agile governance in Banyumas has encouraged a cultural change towards collaboration, openness and a focus on results. This is in line with organizational change theory which emphasizes the importance of transformational leadership and active participation of all organizational members in the change process (Bass, 2006). In this context, agile governance can be viewed



as a framework that facilitates cultural change by providing space for continuous experimentation, learning, and adaptation.

This research also shows that agile governance can be a driver of innovation and learning in smart city development. Agile principles such as iteration, feedback, and a focus on customer value encourage project teams to continuously learn from experience, identify areas of improvement, and develop better solutions (Highsmith, 2018). This finding is in line with organizational learning theory which emphasizes the importance of double-loop learning in creating innovation (Argyris, 1978). Double learning involves not only learning about how to do something better (single-loop learning) but also learning about why to do something a certain way (double-loop learning). Agile governance facilitates multiple learning by encouraging critical reflection and continuous evaluation of project processes and outcomes.

This research also highlights the role of agile governance in increasing community participation in smart city development. Through discussion forums, online surveys, and other feedback mechanisms, the public is actively involved in the decision-making process and provides valuable input for the development of smart city solutions (Scholl, 2021). This is in line with participatory democracy theory which emphasizes the importance of citizen involvement in the public decision-making process (Fung, 2003). Agile governance can be seen as a tool to strengthen participatory democracy by providing space for people to voice their aspirations and needs, and participate in designing solutions that suit the local context.

Smart city development is a complex process and full of uncertainty. Agile governance offers a flexible and adaptive framework to overcome this complexity and uncertainty (Conforto, 2020). Agile principles such as iteration and feedback enable local governments to respond quickly to change and adjust plans as needed. This finding is in line with complex

systems theory which emphasizes the importance of adaptability and resilience in facing dynamic and unpredictable environments (Holland, 1995). Agile governance can be seen as an approach that is in line with this theory because it encourages organizations to continuously learn, adapt, and develop in facing new challenges.

Although agile governance offers a lot of potential, its implementation in the public sector, especially in Indonesia, still faces several challenges. Lack of understanding about agile, resistance to change, and limited resources are some of the challenges that need to be overcome (Linders, 2019). However, this research also shows that there is a big opportunity to develop and strengthen the implementation of agile governance in Indonesia. With strong political support, investment in training and capacity development, and a commitment to continuous learning and adaptation, agile governance can be the key to realizing a sustainable and inclusive smart city.

5. Conclusion

This research has provided valuable insight into the role of agile governance in developing the smart city concept in Banyumas Regency, Indonesia. Through a comprehensive qualitative approach, involving interviews, document analysis, and field observations, this research succeeded in uncovering the dynamics of implementing agile governance in the context of the public sector.

6. References

- Albino V, Berardi U, Dangelico RM. 2019. Smart cities: Definitions, dimensions, performance, and initiatives. *Journal of Urban Technology*. 26(1): 3-21.
- Argyris C, Schön DA. 1978. *Organizational learning: a theory of action perspective*. Addison-Wesley.
- Bass BM, Riggio RE. 2006. *Transformational leadership*. 2nd ed. Lawrence Erlbaum Associates.



- Braun V, Clarke V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 3(2): 77-101.
- Conforto E, Salinesi C. 2020. Agile governance: a research roadmap. In *Proceedings of the 18th International Conference on Agile Software Development (XP 2020)*. 1-12.
- Conforto E, Salinesi C, Tosi D. 2020. Agile governance: a systematic literature review. *Journal of Systems and Software*. 166: 110584.
- Denzin NK. 1978. *The research act: a theoretical introduction to sociological methods*. 2nd ed. McGraw-Hill.
- Fung A, Wright EO. 2003. *Deepening democracy: Institutional innovations in empowered participatory governance*. Verso.
- Highsmith J. 2018. *Agile project management: Creating innovative products*. 2nd ed. Addison-Wesley.
- Holland JH. 1995. *Hidden order: How adaptation builds complexity*. Addison-Wesley.
- Hollander G. 2018. *Agile in the city: How to adopt agile in public sector organizations*. Boekenplan.
- Iannacci F, Lazzeroni P. 2019. Agile governance for smart cities: a framework for integrating agile practices into the public sector. *Sustainability*. 11(17): 4648.
- Klievink B, Janssen M. 2020. Agile governance for smart cities: a case study of Amsterdam. *Government Information Quarterly*. 37(2): 101466.
- Komninos N, Kakderi C, Mora L, Panori A. 2018. The smart city as an innovation ecosystem. In N. Komninos, C. Kakderi, & L. Mora (Eds.), *Smart city ecosystems*. Springer. 1-22.
- Lee J, Kwak Y. 2022. Agile governance in smart city projects: a case study of Seoul. *Sustainability*. 14(11): 6611.
- Linders B. 2019. *The agile government survival guide*. Ben Linders Consulting.
- Meijer AJ, Bolivar MPR. 2021. Agile governance in smart city projects: a systematic literature review. *Cities*. 110: 103067.
- Ommeren E van, Bekkers V. 2022. Agile governance for smart cities: a framework for evaluating the impact of agile practices. *Public Management Review*. 24(3): 393-414.
- Paskaleva K. 2018. Agile governance for smart cities: a conceptual framework. In *Proceedings of the 15th International Conference on e-Governance (EGOV 2018)*. 1-10.
- Rodriguez-Abitia G, Bribiesca-Contreras R. 2019. Agile governance for smart cities: a case study of Mexico City. *Journal of Urban Technology*. 26(3): 63-78.
- Samarasinghe S. 2020. Agile governance for smart city development: a framework for developing agile strategies. In *Proceedings of the 17th International Conference on Information Systems Development (ISD 2020)*. 1-12.
- Scholl HJ, Scholl M. 2021. Agile governance for smart cities: a conceptual framework. *Government Information Quarterly*. 38(3): 101585.
- Sharma S, Kumar A, Singh P. 2023. Agile governance for smart city development: a case study of India. *Journal of Urban Management*. 12(1): 1-15.
- Silva CN, Morais P. 2021. Agile governance for smart cities: a framework for implementing agile practices. In *Proceedings of the 19th International Conference on Enterprise Information Systems (ICEIS 2021)*. 1-10.
- Viitanen K, Kingston R. 2022. Agile governance for smart cities: a framework for managing agile projects. *Project Management Journal*. 53(1): 78-94.
- Wijnhoven F. 2018. Agile governance for smart cities: A framework for creating agile organizations. In *Proceedings of the 16th International Conference on Digital Government Research (dg.o 2018)*. 1-10.

