Co-creating a self-assessment framework for public administrations in climate adaptation projects with a generative governance perspective

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Abstract

Medium-sized cities face important climate change challenges, such as extended droughts and increases in water pressure. To co-create strategies that can effectively tackle such challenges, public administrators require a comprehensive understanding of available options, their efficiency, and organisational capacities. The Interreg North Sea DISCO project aims to address this challenge by co-creating a framework that assesses the maturity of the city administration when co-creating with digital solutions for climate adaptation purposes. The DISCO consortium involves a start-up, two regional authorities, three mediumsized cities, and five research institutes from five countries. This ongoing research paper presents the methodological approach adopted by the DISCO consortium. We position this work within a generative governance perspective, and tools such as virtual reality and twin cities are seen as generative tools. The framework's development involved extensive literature reviews and consortium discussions, incorporating feedback from the partners. The current version, named Self-assessment Framework for Innovative Cocreation (SELFIC), is based on the Assessment of Organisational Maturity for Co-creation Model, which has been refined with DISCO partners' input. We are now processing the second round of feedback and preparing its publication in a digital environment. The final version of the framework will incorporate elements related to a digital tools catalogue and digital literacy. Other researchers within the consortium are developing these elements.

Keywords

Generative governance, maturity assessment, North Sea region

1. Introduction

Medium-sized cities in the North Sea region face important challenges regarding climate change adaptation. Its urban areas are expected to experience increased pressure due to water scarcity, droughts, floods and heatwaves [1]. To address these challenges, public administrators aim to accelerate adaptation in their cities. However, this acceleration requires collaborative approaches that consider the effectiveness of the digital solutions, an equitable perspective, and organisational capacities. All these requirements make it challenging for public administrators to decide on and implement the needed adaptation strategies. This issue results from dealing with the complexity of available data/digital solutions for decision-making, along with the need for timely and just involvement of stakeholders and target groups.

Against this background, we position our work within a generative governance perspective, which focuses on collaborative co-creation away from hierarchical impositions and involves the

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creation of interactive spaces to solve defined problems [2]. This focus allows us to see digital solutions, such as augmented reality (AR), virtual reality (VR), and digital twins, as *generative tools* that support co-creation and help actors visualise and assess future options [2]. However, generativity (capacity to enable) is not limited to the use of tools; it also concerns institutional conditions and capabilities. It requires understanding how digital tools interact with organisational maturity, stakeholder networks, and broader political contexts [2].

To respond to adaptation and co-creation challenges in the context of the North Sea region, eleven partners from five countries (Belgium, Denmark, Germany, the Netherlands, and Sweden) participate in the DISCO (Digital Solutions for Climate Adaptation) project. These partners are the startup AMACHAN, Jade University, University of Oldenburg, University of Twente, VIA University College, Flanders Environment Agency (VMM), Oldenburgisch-Ostfriesische Wasserverband (OOWV), Sweden Water Research, City of Malmö, Municipality of Vejle, and the Municipality of Zwolle. The DISCO project is co-financed by the Interreg North Sea programme (2024-2028). It aims to raise the innovation capacities of governmental organisations and citizens to employ digital solutions to accelerate climate adaptation, and follows a three-step approach:

- 1. **Identify needs**: Develop an assessment framework to identify the specific needs of governmental organisations.
- 2. **Co-creation processes**: Initiate co-creation processes in various locations within the North Sea region, resulting in increased innovation capacity among stakeholders in pilot areas.
- 3. **Sustainability and replication**: Focus on ensuring the sustainability of developed solutions and their replication to boost innovation capacities in the region's organizations.

In the first stage (2024-2025), the project team focuses on co-creating an assessment framework that public administrators can employ to assess their organisational capacities for co-creation in developing and implementing adaptation projects when using digital solutions as generative tools. Based on this focus, the framework's development takes a generative governance perspective [2], [3], [4], [5]. Generative governance focuses on how platforms can support co-creation approaches via different arenas [3]. From a scholarly perspective, while institutional and digital platforms can enable co-creation [3], there is limited understanding of the conditions and capacities that can enable public administrators to implement co-creation approaches for sustainability [5], [6], including climate adaptation strategies. To address this gap, as a first step of the DISCO consortium, we aim to co-create a framework that assesses the maturity of the city administration when co-creating with digital solutions for climate adaptation purposes. The framework is expected to have three components: 1) digital tools catalogue, 2) organisational maturity, and 3) digital literacy.

This ongoing research paper presents our co-creation approach to developing the organisational maturity assessment and is divided into four sections. Section 2 presents the methodological process for developing the organisational maturity assessment. Section 3 shows the results and the latest version of the framework. Finally, section 4 presents the conclusions and the future steps.

2. Methodology

The methodology for developing the organisational maturity assessment consisted of three steps. The first step included a Google (Scholar) review of the literature on digitalisation, co-creation, and climate adaptation. The identified research focused on digital governance [7], digital transformation [8], triple transition (green, social and digital transition) [9], co-creation and the green transition [5], [10], collaborative transition [11], and citizen science and climate governance [12]. These documents were our starting point to discuss how we wanted to frame the development of the organisational maturity assessment. The findings from this first general review were presented by the University of Twente team to all the project partners during consortium meetings in August and September 2024. Following the presentations and feedback, a more systematic approach was implemented.

As a second step, based on the partners' feedback, we conducted a literature review in Scopus to identify both frameworks or models developed to assess organisational maturity in co-created projects and generative governance due to the role envisioned for the tools in the pilot projects. The review was limited to the fields of management, social science and environmental science. In the search, we used the keywords "co-creation" and "maturity", and identified 47 documents from which three articles were of interest ([6], [13], [14]). Meanwhile, in the search using the keyword "generative governance", eight documents were identified, and four were selected ([3], [4], [15], [16]) for further analysis based on their potential relevance for the DISCO project.

As a third step, the selected articles were reviewed, and internal discussions among the University of Twente team were held to propose the organisational assessment approach to the project partners and to decide if an existing framework or model could be used. As part of these activities, the University of Twente team presented and discussed the research review with project partners during the consortium meetings in October and November 2024. The assessment model developed by Jukic et al. (2022) [6] was selected due to its focus on the maturity of European public organisations for co-creation. The first author met Jukic online to explain the DISCO project and to obtain her opinion on using her model for the project. She was very positive in this regard. Figure 1 shows the assessment model [6], which divides the drivers and barriers of co-creation into three categories: 1) organisational capacity focusing on structure, culture, competencies and resources; 2) staff capacity composed of knowledge and skills, attitudes, and autonomy; and 3) wider political and normative context under which public organisations act.

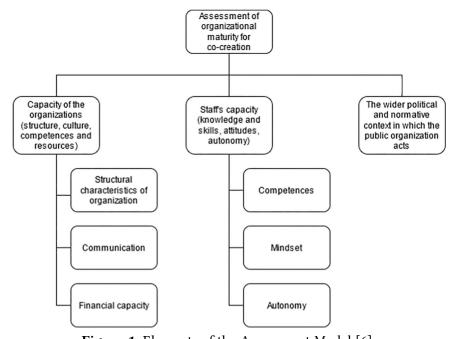


Figure 1: Elements of the Assessment Model [6]

A modified version of the framework was presented by University of Twente researchers to the project partners during the consortium meeting in December 2024 (See Appendix A). Then, they asked the partners to provide feedback on how the model could be further tailored for application in DISCO and to evaluate its usefulness and relevance to the project. A template for providing feedback was shared with the partners via the online file-sharing platform, and a cell in each element of the model, with the name of each partner, was added for feedback. In this way, it was easy to identify who was providing the feedback, and it proved helpful to discuss specific concerns that some partners had. The partners had about a month to provide the feedback, and during the consortium meeting in February 2025, the University of Twente team presented the feedback. The following section summarises the main points and presents the results.

3. Results

The results section is divided into two subsections. The first subsection summarises the feedback the DISCO consortium partners provided, and the second subsection presents the revised version of the assessment framework.

3.1. Results from the first round of feedback

The University of Twente team processed the feedback from all the project partners and presented the results during the consortium meeting in February 2025. The feedback was summarised as follows:

- More focused wording of the questions by referring to the pilots
- Revision of the "quality targets" concept, which was difficult to understand
- Revise the wording of the questions, such as "regularly" or "high profile"
- Divide or simplify the questions that include various topics
- If necessary, provide examples when the question is complex
- Reformulation of questions that can be complex
- Translation into the language of local authorities
- Rename from assessment to "self-assessment."

Not all recommendations were in the same direction; the partners had some discrepancies in how the questions could be answered. Some partners suggested that the questions could be answered with 'yes' or 'no'. Others proposed a scale, and others agreed with open questions. The partner from the Municipality of Zwolle proposed a format in which options are already given. To solve this discrepancy, the University of Twente team prepared an activity for the consortium meeting in February 2025. Using Wooclap, the governmental partners were asked which type of answers they would like to have in the assessment, and the majority voted for the selection of options. Hence, we agreed that future feedback will be required to improve the potential given options.

3.2. The revised version of the self-assessment framework

Based on the feedback, this sub-section presents the revised version of the self-assessment framework for organisational maturity. The framework respects the original elements developed by Jukic et al. (2022). However, the questions were rephrased to focus on the pilots, and options were now given for the answers. Additionally, a concluding question per subgroup was added. Those questions start in the assessment with the word Conclusion, and provide a Likert scale that ranges from poor to excellent. We plan to employ those results to visualise them in a spider-web graph.

- 1. Capacity of the organisation (structure, culture, competencies and resources)
- 1.1. Structural characteristics of the organisation
- **1.1.1. Readiness for change of existing institutional structure:** Has your organisation required structural changes to facilitate social participation in the pilot/project? This can be changes in the structure of the involved departments.

Changes Changes are Significant Moderate Minor changes No changes required but no being planned changes changes required action	•	U	Significant changes	Moderate changes	Minor changes	.0
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1.1.2. Network governance/highly connected structure. How connected is your organisation with a network that can facilitate the implementation of the pilot/project?

No connected	Connections	Limited	Moderately	Well-	Highly
	are being	connected	connected	connected	connected
	planned				

facilitating co-cr					
No	Collaborative	Limited	Moderate	Good	Highly
collaborative	culture is being	collaboration	collaboration	collaboration	collaborative
culture	developed				
1.1.4. Qualit	v targets: To	what degree do	es vour organis	sation consider	aspects such as
. —		ches for the pilo			T
No	Planning	Limited	Moderately	Well	Highly
consideration	consideration	consideration	considered	considered	considered
	ses, how would y				considering your ganisation for the
10.0					
1.2. Commu		ination: De	vojim ommarii'	n horro acti-	oug ond1
		•			ous and mutual
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communication	mutual	mutual	mutual	mutual	mutual
Communication	communication	communication			
engagement	engagement	engagement	engagement	engagement	engaged
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1.3.3 Conclus	ion on funding:	Considering you	ur previous res	oonses, how would	you assess the
	of your organisat			,	,
			Very good (2)	Excellent (3)	
2. Staff capaci 2.1 Competence 2.1.1 Soft skil conflict managem	s Is staff member			our organisation is /project?	n dealing with
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		_		f in your organis	ation received
education and trai					
No training	Under training	Limited training	Moderate training	Adequate training	Extensive training
2.1.3 Conclus	sion on compet	encies: Conside	ring vour prev	vious responses, ho	ow would voi
	-			vious responses, ho	ow would you
assess the staff cap	. , , .		<u> </u>		
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your organisation				_	
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		_		nization: Does th	•
				ing a positive publ	
No consideration	Developing consideration	Limited consideration	Sometimes considered	Mostly considered	Always considered
2.2.4 Top-leven	-			tes of co-creation	n: Do the to
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rr		support	support	support	supportive
		٠.		ponses, how would	you assess th
mindset aspect of			Very good (2)	Excellent (3)	
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2.3 Autonomy 2.3.1 Level of		ng autonomy: I	Does the staff in	n your organisatio	n have enoug
autonomy to impl	ement the pilot/p	roject?			
No autonomy	Developing	Limited	Moderate	Adequate	Highly

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4. Conclusion and further steps

This paper presented the development of a self-assessment framework for organisational maturity within the DISCO project, focusing on how public administrations can strengthen their capacity for co-creation using digital tools for climate adaptation. Our generative governance focus has influenced our work in two main ways. 1) It helps us to frame digital tools not just as efficiency enhancers but as generative tools that can support mutual learning and collaboration. So, they can serve as shared reference points to enhance co-creation. Second, it helps us highlight the institutional and relational capacities necessary to use these tools effectively. The framework aims to assess technical readiness and key factors like collaborative culture, leadership support, stakeholder communication, and regulatory flexibility, all essential for creating environments where co-creation can thrive.

The revised version of the framework has incorporated the feedback from the DISCO partners. The new version emphasises that it is a self-assessment. Hence, it has been named the Self-assessment Framework for Innovative Co-creation (SELFIC). SELFIC refers explicitly to the pilot/project and assumes that such projects use digital solutions/tools and aim at innovative strategies for climate adaptation. The questions were also simplified and reformulated to be more explicit. Being focused on the pilot has also helped to make the questions more explicit about what they refer to. However, this is still an ongoing process. This new version was presented to the DISCO partners during the consortium meeting in April 2025 in Oldenburg, Germany. There, we had a workshop to receive a second round of feedback. This new version was presented within a digital participatory platform developed by the consortium partner AMACHAN. AMACHAN provides a platform that connects citizens, social innovation approaches, and decision-makers. Their expertise lies in developing questionnaires and maps that can support co-creation approaches.

Currently, we are incorporating questions related to the digital tools catalogue and digital literacy to develop a more comprehensive framework for DISCO. We are also considering adding other questions about the co-creation process itself, as a link to the second step of DISCO. These additional aspects are being developed by other research partners, with whom we often communicate to ensure the alignment of the different tasks that we are developing. Once we have the final version of the framework, we plan to ask the project partners for support in translating the questionnaire into the languages of their local authorities. Despite the aim of developing a comprehensive framework, we are aware of the consortium's limitations. The development and application of the project are related to cities in Northern Europe, such as Zwolle, which are considered frontrunners in climate adaptation [17]. Therefore, their needs differ from those of the cities considered followers. Being aware of such limitations is important as we aim, by the end of the project in 2028, to have developed a framework that can be useful to various cities in the Northern region and, if possible, in other European regions.

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6. Appendix A

Main	Sub-elements	Questions	Your comments:
elements			Is the question
			relevant? Could
			you answer it? If
			not do you have
			a proposal?
1. Capacity of	1.1. Structural	1.1.1. Readiness for change of existing	VIA: AMACHAN:
the	characteristics of	institutional structure: Has your	OOWV: UOL:
organisation	organisation	organisation had structural changes to	JADE: SWR:
s (structure,		facilitate social participation with digital tools	Zwolle: Veijle:
culture,		in climate adaptation projects? This can	VMM: CoM:
competencies		involve changes in the structure of	

•			
and		departments or the creation of	
resources)		communication channels. 1.1.2. Network governance/highly	VIA: AMACHAN:
		1.1.2. Network governance/highly connected structure. Is your organisation	OOWV: UOL:
		part of a well-connected network that	JADE: SWR:
		facilitates the use of digital tools for climate	Zwolle: Veijle:
		adaptation?	VMM: CoM:
		1.1.3. Collaborative culture. Does your	VIA: AMACHAN:
		organisation have a collaborative culture	OOWV: UOL:
		that facilitates co-creation with the use of	JADE: SWR:
		digital tools for climate adaptation projects?	Zwolle: Veijle:
			VMM: CoM:
		1.1.4. Quality targets: Does your	VIA: AMACHAN:
		organisation consider quality targets (e.g.	OOWV: UOL:
		inclusivity or innovations) in climate adaptation projects using digital tools?	JADE: SWR: Zwolle: Veijle:
		adaptation projects using digital tools:	VMM: CoM:
	Considering your p	revious responses, on a scale of poor, below	VIA: AMACHAN:
		ood, very good and excellent, how would you	OOWV: UOL:
		characteristics of your organisation for using	JADE: SWR:
		ate adaptation projects?	Zwolle: Veijle:
			VMM: CoM:
	1.2.	1.2.1 Continuous, two-way	VIA: AMACHAN:
	Communication	communication: Does your organisation	OOWV: UOL:
		have a bilateral and continues communication	JADE: SWR:
		with external stakeholders regarding digital	Zwolle: Veijle:
		tools for climate adaptation? 1.2.2 Engaging activities with	VMM: CoM: VIA: AMACHAN:
		1.2.2 Engaging activities with stakeholders: Does your organisation	OOWV: UOL:
		regularly engage stakeholders in activities	JADE: SWR:
		regarding the use of digital tools for climate	Zwolle: Veijle:
		adaptation?	VMM: CoM:
		1.2.3 Structured stakeholder analysis: Has	VIA: AMACHAN:
		your organisation conducted a stakeholder	OOWV: UOL:
		analysis to identify the actors that need to be	JADE: SWR:
		part of the co-creation process when using	Zwolle: Veijle:
		digital tools?	VMM: CoM:
		1.2.4 Existence of specialised staff	VIA: AMACHAN:
		members: Are staff members from your organisation actively collaborating with	OOWV: UOL: JADE: SWR:
		residents regarding digital tools in climate	Zwolle: Veijle:
		adaptation projects?	VMM: CoM:
		1.2.5 Evidence about impact: Does your	VIA: AMACHAN:
		organisation formally assess and	OOWV: UOL:
		communicate the positive impact of co-	JADE: SWR:
		creation using digital tools for climate	Zwolle: Veijle:
		adaptation?	VMM: CoM:
		revious responses, on a scale of poor, below	VIA: AMACHAN:
		ood, very good and excellent, how would you	OOWV: UOL:
		tion's communication for using digital tools for	JADE: SWR:
	climate adaptation p	rojects?	Zwolle: Veijle: VMM: CoM:
	1.3. Financial	1.3.1Funding and incentives: Does your	VIA: AMACHAN:
	capacity	organisation have appropriate funding for co-	OOWV: UOL:
		creation activities involving digital tools for	JADE: SWR:
		climate adaptation projects?	Zwolle: Veijle:
			VMM: CoM:
		1.3.2 Budgetary benefits: Does your	VIA: AMACHAN:
		organisation benefit from budget incentives	OOWV: UOL:
		for co-creation processes using digital tools in	JADE: SWR:
		climate adaptation projects?	Zwolle: Veijle:
			VMM: CoM:

	average, average, go	revious responses, on a scale of poor, below ood, very good and excellent, how would you capacity of your organisation for using digital ptation projects?	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
2. Staff capacity	2.3 Competences	2.1.1 Soft skills by frontline staff members: Do frontline public servants in your organisation possess soft skills, such as conflict management, facilitation, and negotiation, regarding digital tools for climate adaptation projects?	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
		2.1.2 Co-creation education and trainings: Have frontline public servants in your organisation received education and training on co-creation processes that use digital tools for climate adaptation projects?	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
	Considering your p average, average, go assess the staff capar for climate adaptation	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:	
	2.2 Mindset	2.2.1 Supportive perceptions on cocreation: Does your organisation generally have a positive perception on co-creation projects that use digital tools for climate adaptation projects?	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
		2.2.2 Awareness of the benefits from collaboration with the public: What is your organisation's perception of public participation in climate adaptation projects that include digital tools in co-creation	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
		processes? 2.2.3 Desire for positive public image of the public organization: Does your organisation consider co-creation with digital tools for climate adaptation as part of creating a positive public image?	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
		2.2.4 High profile public servants take the role of advocates of co-creation: Does your high-profile public servants in your organisation support projects that use digital tools for climate adaptation projects?	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
	average, average, go	revious responses, on a scale of poor, below ood, very good and excellent, how would you spect of your organisation for using digital tools	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
	2.3 Autonomy	2.3.1 Level of decision-making autonomy: Does your organisation have enough autonomy to use digital tools in climate adaptation projects?	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
		2.3.2 Readiness to give significant discretion to external co-creators: Is your organisation flexible enough to provide external co-creators with enough discretion in projects that use digital technologies for climate adaptation projects?	VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:
		2.3.3 Tailor-made solutions matching needs of each individual: To what extent does your organisation take into account the	VIA: AMACHAN: OOWV: UOL: JADE: SWR:

	needs of different individuals when using	Zwolle: Veijle:
	digital tools for climate adaptation projects?	VMM: CoM:
	Considering your previous responses, on a scale of poor, below	VIA: AMACHAN:
	average, average, good, very good and excellent, how would you	OOWV: UOL:
	assess the autonomy of your organisation for using digital tools for	JADE: SWR:
	climate adaptation projects?	Zwolle: Veijle:
		VMM: CoM:
3. The wider	3.1 National legislation in favour of co-creation: Do you	VIA: AMACHAN:
political and	consider that national legislation supports co-creation processes	OOWV: UOL:
normative	that use digital technologies for climate adaptation projects?	JADE: SWR:
context in		Zwolle: Veijle:
which the		VMM: CoM:
public	3.2 Flexible regulative framework: Do you consider that the	VIA: AMACHAN:
organization	regulations that apply to your organisation are flexible enough to	OOWV: UOL:
acts	facilitate co-creation processes that use digital technologies for	JADE: SWR:
	climate adaptation projects?	Zwolle: Veijle:
		VMM: CoM:
	3.3 Collaborative institutional environment: Do you consider	VIA: AMACHAN:
	that your organisation (from a wider perspective) has a collaborative	OOWV: UOL:
	environment that facilitates the use of digital technologies for	JADE: SWR:
	climate adaptation projects?	Zwolle: Veijle:
		VMM: CoM:
	3.4 Support and promotion of co-creation by international	VIA: AMACHAN:
	organizations: Do you consider that your organisation has support	OOWV: UOL:
	from international organisations, such as the OECD or EU, to use	JADE: SWR:
	digital technologies for climate adaptation projects?	Zwolle: Veijle:
		VMM: CoM:
	3.5 Strong political will for co-creation: Do you consider that	VIA: AMACHAN:
	there is political will to support co-creation in your organisation to	OOWV: UOL:
	use digital technologies for climate adaptation projects?	JADE: SWR:
		Zwolle: Veijle:
		VMM: CoM:
	Considering your previous responses, on a scale of poor, below	VIA: AMACHAN:
	average, average, good, very good and excellent, how would you	OOWV: UOL:
	assess political and normative context under which your	JADE: SWR:
	organisation works using digital tools for climate adaptation	Zwolle: Veijle:
	projects?	VMM: CoM:

General comments: VIA: AMACHAN: OOWV: UOL: JADE: SWR: Zwolle: Veijle: VMM: CoM:

• How can this questionnaire be improved? Is it useful? Is it relevant?

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Declaration on Generative AI

While preparing this work, the authors used Grammarly to check grammar and spelling. After using this tool, the authors reviewed and edited the content as needed and they take full responsibility for the publication's content.