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Evaluating the Integration of One Health Approaches within National Action Plans for Antimicrobial Resistance in Africa

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Running Title: One Health Integration in African AMR Plans

Abstract

Antimicrobial resistance (AMR) is a major global health threat requiring coordinated action across human, animal and environmental sectors through a One Health approach. This study assessed the extent to which AMR National Action Plans (NAPs) in Africa incorporate One Health principles and identified areas for strengthening implementation. A structured assessment framework was developed to review NAPs published between 2015 and 2025 and retrieved from the World Health Organization, Food and Agriculture Organization and national repositories. NAPs were assessed across three domains: scope, governance and coordination, and implementation strategies. One Health integration was strongest in scope and objectives (mean 95%), but weaker in governance (81%) and implementation strategies (93%). While most NAPs demonstrated strong conceptual alignment with One Health, weaknesses in governance, coordination and implementation may limit their effectiveness. Strengthening cross-sectoral coordination and implementation capacity is essential to translate policy commitments into effective AMR action.

Keywords: Antimicrobial Resistance; National action plans; Africa; One Health;

Introduction

Antimicrobial resistance (AMR) is a growing global crisis that threatens the effectiveness of antibiotics, making infections harder to treat and increasing the risk of disease spread, severe illness and death [1]. The misuse and overuse of antimicrobials in human medicine, agriculture and environmental settings largely drives the emergence and spread of resistant microorganisms [2]. Low-Middle- Income Countries (LMICs) are particularly vulnerable to

the consequences of AMR due to weak regulatory frameworks, limited healthcare infrastructure, and inadequate surveillance systems [3]. To address this challenge, the One Health Approach has been promoted as an integrated solution that considers the interconnectedness of human, animal and environmental health in AMR mitigation strategies [4]

The One Health approach recognizes that AMR is not confined to a single sector but is instead a complex problem that requires coordinated efforts across human health, veterinary medicine, and environmental sciences [5]. In response to the growing AMR crisis, the World Health Organization (WHO) launched the Global Action Plan (GAP) on AMR in 2015, urging countries to develop National Action Plans (NAPs) that incorporate One Health principles [6]. By 2022, more than 80% of LMICs had developed NAPs, yet the effectiveness of these policies remains uneven due to differences in Implementation, funding and enforcement capacity [7].

Despite the widespread adoption of AMR policies, LMICs continue to face significant barriers to effective implementation. Weak regulatory frameworks allow antibiotics to be sold over the counter without prescriptions, leading to widespread misuse and increased resistance rates [8]. Additionally, many LMICs lack comprehensive AMR surveillance systems, particularly in veterinary and environmental sectors, making it difficult to monitor resistance trends and assess policy impact [5]. Inadequate funding further limits the ability of governments to enforce AMR policies, invest in laboratory infrastructure, and promote public awareness campaigns [1].

One of the key challenges in AMR policy enforcement is the lack of intersectoral collaboration. The One Health Approach requires coordination between ministries of health, agriculture, and the environment, yet many LMICs operate with little cross-sectoral engagement [9]. Without strong governance structures, AMR policies remain ineffective in curbing the rise of resistant infections across human, animal, and environmental domains.

This study aimed to assess the extent to which African NAPs for AMR integrate the One Health framework. Additionally, the study also aimed to identify gaps and provide actionable recommendations to strengthen these plans and improve their effectiveness.

Methods

Ethical Consideration

This study was based exclusively on the review and analysis of publicly available AMR NAP documents from African countries. As such, the study did not involve human participants, personal data, or any intervention.

Nonetheless, the study upheld ethical research practices throughout. All documents were accessed through official and publicly accessible sources, and proper citation was maintained to acknowledge the origin of each NAP. The analysis was conducted objectively, ensuring accuracy, transparency, and respect for the integrity of the original documents.

To minimise the risk of unintended offence, countries were represented using random letters, ensuring anonymity.

Efforts were made to avoid misrepresentation or misinterpretation of content, structure and strategies. Findings were presented constructively and respectfully.

Study design

This study used a desk review to assess the integration of the One Health framework within African National Action Plans (NAPs) for Antimicrobial Resistance. Rather than collecting primary qualitative data, the study reviewed existing national policy documents to examine how One Health principles are articulated and operationalized within AMR strategies. By using structured analytical criteria, the review enabled a detailed analysis of NAP components across countries and facilitated the identification of thematic gaps and areas of alignment with One

Health priorities. The desk review helped identify what was already working well, where the gaps were, and how different countries were putting One Health ideas into practice.

Procedure

Development of Assessment Framework

A clear framework for assessing One Health integration, based on established guidelines and best practices. This included a questionnaire and an Excel spreadsheet to assess if a National Action Plan for AMR integrated a One Health framework, examining the plan's content, structure, and implementation strategies, focusing on cross-sectoral collaboration, addressing human, animal, and environmental aspects, and utilizing a holistic approach to the AMR framework.

NAP search strategy and retrieval

Existing and published NAPs were retrieved from WHO or FAO repositories between April 2025 and May 2025. For countries not included in the list, an internet search was conducted to determine whether a NAP is available in a national or other regional database. For NAPs that were not in English, an internet search was conducted to determine whether an English version was available.

Qualitative data extraction and coding

A structured data collection tool (questionnaire) was used to facilitate systematic review and capture key One Health elements from the individual AMR National Action Plans. Data extraction was through line-by-line content analysis, structural analysis and review of implementation strategies related to the integration of One Health principles across multiple domains. The study used thematic coding to assess the presence and depth of One Health elements. Independent reviewers assessed the NAPs that met the inclusion criteria

Inclusion and exclusion criteria

Inclusion criteria

- AMR National action plans from the African region
- NAPs published between 2015-2025
- NAPs available in English or with official translations.
- Documents published by government health agencies and international organizations.

Exclusion criteria

- All unofficial National action plans that are yet to be published.
- AMR NAPs that are unavailable in English
- AMR National action plans from countries outside the African region

Data Analysis

Data were analysed using a combination of qualitative content analysis and basic quantitative descriptive analysis. First, a deductive coding framework was applied to each AMR national action plan according to key One Health domains. These domains were derived from internationally recognized guidelines, including FAO-WHO-WOAH Tripartite documents and the Global Action Plan on AMR.

Each NAP was scored using a simple ordinal scale; these scores helped generate summary statistics such as frequencies and percentages across countries and domains.

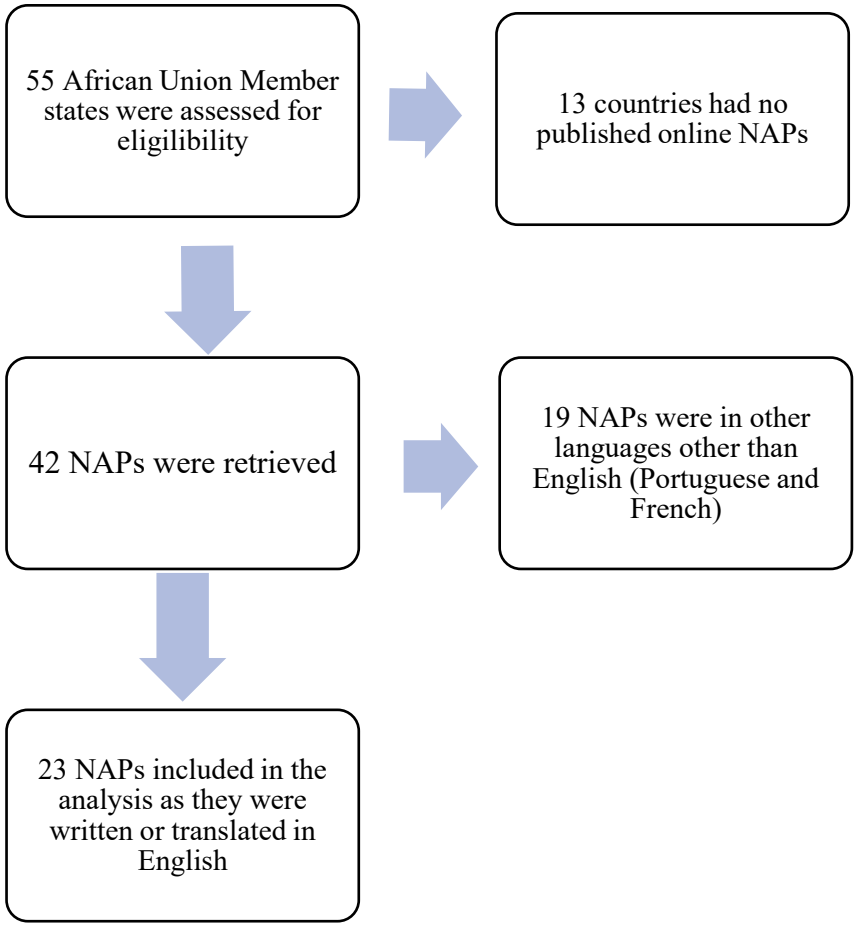
In addition to quantitative scoring, qualitative comments were analysed to provide context and insight into how countries framed and articulated One Health elements. The results were themed to common gaps and strengths in One Health integration and highlight regional trends and patterns across the African continent.

Results

National action plans identified

Out of the 55 African Union member states, 42 (76%) were identified as having developed a National Action Plan (NAP) on antimicrobial resistance. However, not all were accessible for detailed review. Of these 42, 23 (54.7%) were available in English and therefore eligible for analysis in this study (Figure 1). The majority of NAPs were published between 2017 and 2019, reflecting a period of heightened momentum following the release of the WHO Global Action Plan on AMR in 2015.

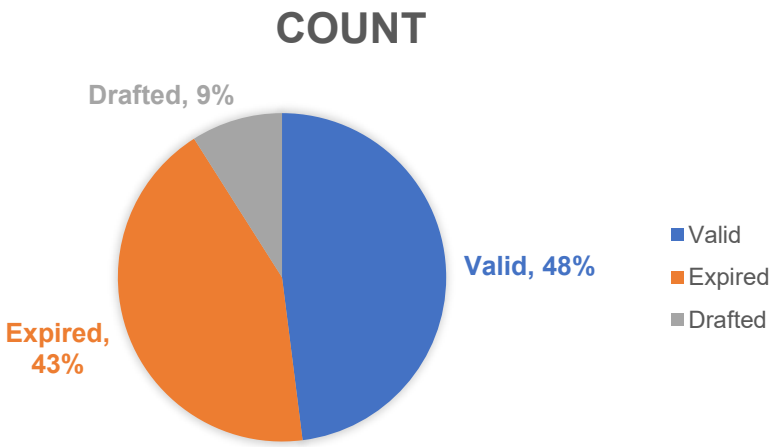
Figure 1*:* Flow diagram of search and retrieval of country NAPs for inclusion in the analysis.



Status of NAPs

Among the 23 analysed NAPs, 11 (48%) were valid, 10 (43%) had expired, and 2 (9%) were still in draft form (Figure 2). This distribution indicates that almost half of the countries had not updated their NAPs, raising questions about sustainability and renewal of AMR strategies at the national level. The two draft NAPs further suggest that some countries are still at an early stage of operationalizing the One Health approach.

Figure 2: Percentage of countries with Valid, Expired and Drafted NAPs



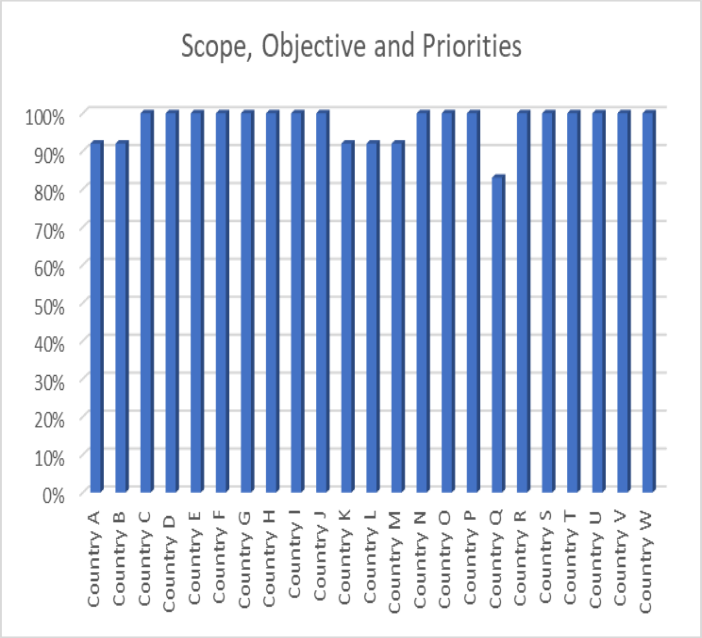
Integration of One health domains

The NAPs were assessed across three main domains:

Scope, Objectives and Priorities; Governance and Coordination, Implementation Strategies

Figure 3 The performance of each country across the three domains. The overall findings showed strong inclusion of One Health principles in the scope, objectives, and priorities section and countries scored slightly in governance, coordination, and implementation strategies.

(a)


Scope, Objective and Priorities
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Country A
Country B
Country C
Country D
Country E
Country F
Country G
Country H
Country I
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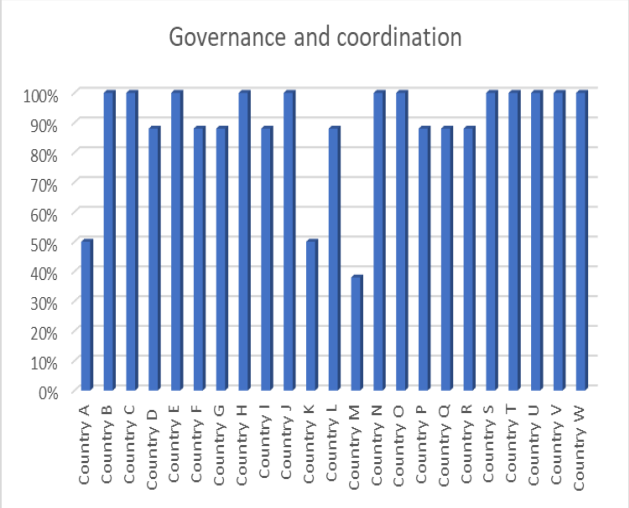
(b)


Governance and coordination
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Country A
Country B
Country C
Country D
Country E
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Country G
Country H
Country I
Country J
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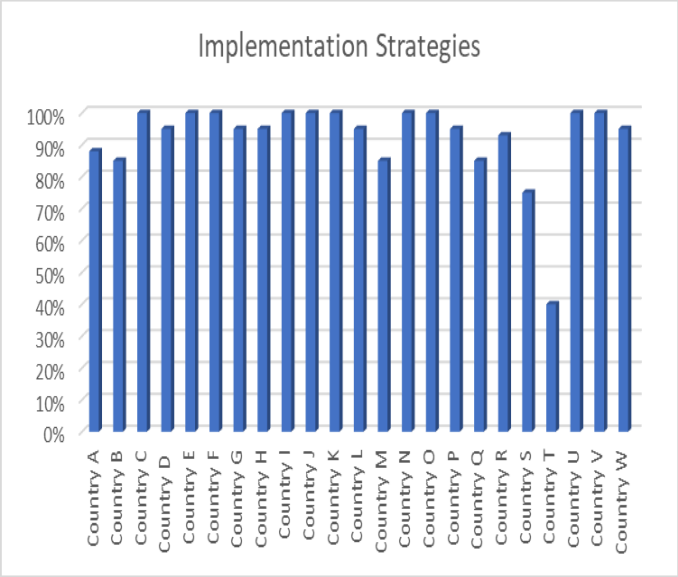
(c)


Implementation Strategies
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
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Country A
Country B
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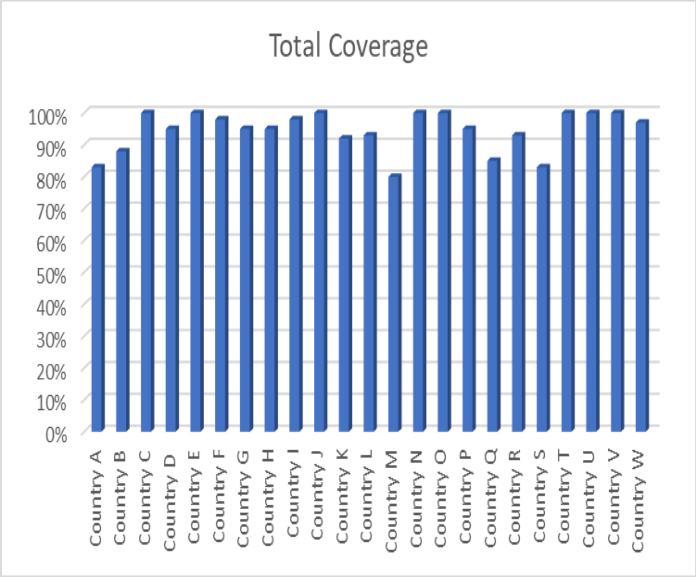

Scope, Objectives and Priorities

This was the strongest performing domain, with most countries achieving high scores, typically above 90%. Clear articulation of AMR as a cross-sectoral challenge was a recurring strength. Countries often referenced international guidelines such as those developed by WHO, FAO, World Organisation for Animal Health (WOAH), signalling alignment with global policy frameworks. Many NAPs also recognized the need to include human, animal, and environmental health dimensions in their objectives.

Despite this, several gaps were identified. A consistent limitation was the lack of multi-ministerial endorsement. In most countries, only the Minister of Health was formally listed as an approver or signatory of the NAP, with little evidence of equal involvement from ministries of agriculture, livestock, or environment. This restricted the perceived ownership of the NAPs and may undermine cross-sectoral collaboration during implementation.

Governance and coordination

This domain revealed the most significant weaknesses, with scores ranging from as low as 38% to as high as 100%. Countries with stronger performance described the establishment of multi-sectoral coordination committees, inter-ministerial task forces, or designated focal points

tasked with facilitating communication across the human, animal, and environmental sectors. These structures were often accompanied by explicit terms of reference and clear reporting lines, which are essential for sustaining a One Health response.

In contrast, countries with lower scores often lacked defined coordination mechanisms. Some NAPs referred to a "multi-sectoral approach" in broad terms without specifying how such collaboration would be operationalized. In these cases, there was little evidence of institutional frameworks for joint decision-making, budget allocation, or accountability across sectors. This highlights a critical gap between rhetorical commitments to One Health and the concrete governance arrangements required to implement it effectively.

Implementation strategies

Implementation strategies showed mixed levels of integration, with scores ranging from 75% to 100%. High-performing NAPs outlined clear implementation frameworks, including timelines, deliverables, budget considerations, and monitoring and evaluation indicators. These strategies frequently covered human, animal, and environmental health sectors, suggesting a stronger translation of the One Health concept into operational activities.

However, other NAPs were more aspirational in tone. They often identified broad goals without attaching concrete actions, resources, or measurable indicators. In some cases, implementation strategies were disproportionately health-sector focused, with limited mention of interventions targeting veterinary services, food safety, or environmental management. The absence of sector-specific deliverables reflects a missed opportunity to fully operationalize the One Health approach.

Overall Performance

When combining all three domains, only a handful of countries achieved near-complete alignment with the One Health framework. Several countries, such as those scoring close to

100%, provided comprehensive coverage across domains, indicating that their NAPs were well aligned with global One Health principles. By contrast, other countries scored closer to 80%, reflecting weaker governance and fragmented implementation planning.

Overall, while the majority of NAPs demonstrated conceptual awareness of the One Health framework in their scope and objectives, this did not consistently translate into practical mechanisms for coordination and implementation. The results highlight a gap between policy articulation and actionable planning, with governance structures often being the weakest link.

Discussion

This study assessed how African National Action Plans (NAPs) on antimicrobial resistance integrate the One Health framework. Of the 55 African Union member states, 42 had developed NAPs, but only 23 were available in English and analysed. The findings revealed that while most countries strongly incorporated One Health principles into their NAP scope, objectives, and priorities, fewer demonstrated strong governance structures or detailed implementation strategies.

The dominance of expired or soon-to-expire NAPs (43%) highlights a challenge of sustainability, echoing previous global reviews which have noted that many low- and middle-income countries struggle to update and renew their AMR plans[10,11]. The finding that most NAPs were published between 2017–2019 suggests initial enthusiasm following the WHO Global Action Plan in 2015[6], but a decline in momentum for regular updates.

The strong performance in defining scope and priorities aligns with WHO evaluations that emphasize political recognition of AMR as a multi-sectoral issue. However, similar to reports from Asia [12](3), African NAPs often lack operational detail for governance and cross-sectoral coordination. This reflects a broader global challenge in translating the One Health concept into institutional practice.

Governance and coordination emerged as the weakest domain in this study, with only a few countries scoring above 90%. This gap suggests that while policy rhetoric often highlights One Health, operational mechanisms such as inter-ministerial committees, resource-sharing frameworks, and accountability structures remain underdeveloped[13]. Weak governance can undermine implementation by creating unintegrated responses in human, animal, and environmental health sectors. Similar challenges have been reported in regional analyses[14], where the health sector tends to dominate AMR governance [15],while veterinary and environmental voices are marginal[16].

Although some NAPs outlined clear implementation frameworks with deliverables and monitoring indicators, many remained aspirational. This imbalance risks creating policy documents that lack feasibility and impact. Limited inclusion of veterinary and environmental strategies in lower-scoring NAPs highlights persistent gaps in cross-sectoral operationalization. These findings reinforce concerns raised in the Tripartite (WHO, FAO, WOAH)[17] progress reports that One Health integration often stops at the planning stage and does not translate into action.

For Africa, the findings have several implications. First, the high proportion of expired NAPs calls for renewed political will and resource allocation to ensure continuity of national AMR strategies. Second, according to a study done by Chua et al it indicates that greater investment in governance structures such as empowered national AMR coordination committees with cross-sectoral representation is essential to operationalize One Health[18]. Third, implementation plans must go beyond aspirational statements by incorporating costed action plans, measurable indicators, and mechanisms for accountability[19]. Finally, strengthening surveillance and laboratory systems across human, animal, and environmental health sectors is critical to inform and evaluate progress.

Recommendations

This analysis demonstrates that while most African National Action Plans (NAPs) on AMR incorporate the One Health framework in their scope and objectives, weaknesses in governance and uneven implementation strategies limit their effectiveness. To address these gaps, countries should prioritize updating expired or draft NAPs through institutionalized review cycles every three to five years to ensure continuity and alignment with evolving global standards. Strengthening governance is paramount: empowered multisectoral coordination committees with active representation from human, animal, and environmental health sectors are essential for fostering accountability and cross-sectoral collaboration.

Implementation strategies must go beyond aspirational statements by incorporating costed activities, clear timelines, measurable indicators, and decentralized responsibilities to ensure effective delivery at subnational levels. Greater inclusion of veterinary and environmental sectors is also needed, given their critical role in AMR emergence and containment. Sustainable financing, including dedicated domestic budget lines, will reduce reliance on donor funding and provide long-term stability.

Finally, investments in integrated surveillance systems across human, animal, and environmental health, alongside regional collaboration through platforms such as Africa CDC, are necessary to harmonize approaches and share best practices. Collectively, these measures will help African countries move from policy intent to effective operationalization of the One Health framework in combating AMR.

Limitations

This study analysed only English-language NAPs, which excluded documents available in French, Arabic, or Portuguese. As such, results may not fully represent all African AMR plans. Furthermore, the analysis was limited to policy documents and did not evaluate actual

implementation on the ground, which may differ substantially from written commitments. Future research should complement document analysis with interviews, budget reviews, and implementation assessments. Lastly, few studies deeply examine environmental sector integration, so more research is needed into how environment ministries are engaged, how policies on waste, water, soil, and pollution are handled.

Conclusion

In conclusion, African countries have made progress in aligning their NAPs with the One Health framework, particularly in defining scope and priorities. However, weaknesses in governance and uneven implementation strategies threaten the translation of these plans into meaningful action. Strengthening coordination mechanisms, updating expired NAPs, and ensuring multi-sectoral accountability are critical steps for advancing AMR containment in Africa. Sustained investment and political commitment will be required to bridge the gap between policy intent and operational reality.

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