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Beyond publish or perish: A Content as a Service framework for research impact tracking in university– community knowledge ecosystems

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Research Article

Keywords: Research impact, altmetrics, bibliometrics, Content as a Service, knowledge dissemination, knowledge uptake, university–community engagement, academic profiles, public return on investment, Zimbabwe

Posted Date: September 4th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10545046/v1

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Additional Declarations: No competing interests reported.

Abstract

Background

An academic can publish and still perish if the research they generate is not consumed by the communities they research upon. The dominant publish-or-perish incentive structure reduces research impact to citation counts, overlooking the tangible and intangible contributions that scholarship makes to the well-being and sustainable development of society. Research impact tracking, as a return on public investment in higher education, demands evidence that knowledge travels from its generators to its intended beneficiaries. Content as a Service (CaaS), an architecture that decouples content from its presentation layer and enables dynamic, API-mediated delivery, offers an under-utilised infrastructure for embedding impact tracking directly into the knowledge dissemination process.

Objectives

This article proposes and theorises a CaaS-enabled Research Impact Tracking Framework (RITF) that operationalises both traditional bibliometric and alternative metric (altmetric) indicators within a structured content lifecycle, with specific application to African university – community knowledge ecosystems.

Method

The paper draws on qualitative and quantitative empirical data from a study conducted at the University of Zimbabwe (UZ) and Bindura University of Science Education (BUSE), supplemented by a critical synthesis of the impact measurement, altmetrics and CaaS architecture literature.

Results

Empirical evidence demonstrates that despite high academic publication rates, community knowledge uptake at UZ and BUSE is negligible under existing dissemination models. CaaS delivery channels, including API-mediated content logs, community download analytics, vernacular media engagement metrics and feedback loop data, generate a richer, multi-layered impact signal than citation-based systems alone. The proposed RITF aligns impact indicators across four dimensions: reach, engagement, uptake and societal change.

Conclusion

A CaaS architectural approach to research impact transforms dissemination from a passive archiving function into an active, measurable knowledge transfer mechanism. Tracking community-facing impact

strengthens academic profiles for grant applications, promotion reviews and cross-sector collaboration while demonstrating return on public funding.

Contribution:

The article introduces the CaaS-enabled Research Impact Tracking Framework (RITF) as a conceptual and practical tool for information and knowledge management, advancing both altmetrics theory and CaaS literature within the African higher education context, and addressing the critical gap between knowledge generation and its societal contribution.

Introduction

The aphorism ‘publish or perish’ has governed academic incentive structures for decades. Yet within university–community knowledge ecosystems in sub-Saharan Africa, a structurally silent companion problem is emerging: an academic can publish and still perish if the research they generate is not consumed, applied, or responded to by the communities upon which that research was conducted. Research outputs that accumulate in institutional repositories unread, uncited by practitioners, or inaccessible to the public represent not merely missed opportunities but a failure of the social contract that justifies public investment in higher education. As Martin (2011:249) argues, research impact tracking is fundamentally a return on investment narrative, evidence that public funding for scholarship translates into tangible improvements in society’s well-being, capability and development.

Research impact is both tangible and intangible. Tangible impact includes measurable changes in policy, practice, health outcomes, agricultural yields, educational attainment, or economic productivity that can be directly attributed to research engagement. Intangible impact encompasses shifts in community awareness, attitude change, empowerment narratives, cultural affirmation and the long-cycle effects of changed thinking that precede changed behaviour (Bornmann, 2013; Penfield et al., 2014). Both dimensions are legitimate and documentable, but only if the research dissemination infrastructure is designed to generate the evidence trail. Most institutional repositories are not. They are, by design, archiving mechanisms, collect, store, preserve, not impact-monitoring systems.

Content as a Service (CaaS) offers a structurally different proposition. By treating content as a dynamically deliverable service rather than a static archive, CaaS generates interaction logs, delivery confirmations, engagement metrics, community feedback data and downstream usage signals at every point of the content lifecycle (Voigt et al., 2021; Doglio, 2019). When this interaction data is systematically harvested, organised, and mapped against impact indicators, the CaaS architecture becomes not just a dissemination platform but a research impact tracking instrument.

This article theorises and proposes a CaaS-enabled Research Impact Tracking Framework (RITF) grounded in empirical evidence from a DPhil study conducted at the University of Zimbabwe (UZ) and Bindura University of Science Education (BUSE). The study documented a severe disconnect between

academic knowledge generation and community knowledge uptake: the two universities produce substantial research output, yet IR population rates remain negligible (the largest repository acquired only 2 520 items in a decade), community awareness of research is minimal, and no systematic mechanism exists for measuring whether research reaches or influences the communities it is designed to serve. The proposed RITF addresses this gap by embedding impact tracking within the CaaS delivery architecture itself, using a combination of traditional bibliometric indicators, altmetrics, community engagement analytics, and qualitative uptake evidence to construct a multidimensional, publicly accountable picture of research impact.

The argument unfolds across four sections. The literature review establishes the theoretical and conceptual foundations of research impact, altmetrics and CaaS-mediated dissemination. The methodology section describes the empirical basis and framework construction process. The results section presents the RITF in full, with its indicator dimensions, CaaS delivery mechanisms and application to the Zimbabwean context. The discussion addresses implications for academic profiling, grant acquisition, promotion and cross-sector collaboration.

Rethinking research impact: Beyond citations

Research impact has traditionally been operationalised through bibliometric proxies: journal impact factors, citation counts, h-indices and eigenvector centrality measures such as the Eigenfactor. These indicators capture the scholarly conversation, how much a piece of research influences other researchers, but they are structurally blind to how research influences practitioners, communities, policymakers and the public. The seminal work of Martin (2011:249) on the ‘payback framework’ for health research established a more expansive conception of impact, arguing that publicly funded research must demonstrate returns across five domains: knowledge production, research targeting and capacity building, informing policy and product development, health and health sector benefits, and broader economic benefits.

Subsequent frameworks have generalised and extended Martin’s payback model. Penfield et al. (2014) distinguish between ‘academic impact’ (influence on the scholarly community) and ‘wider impacts’ (influence on society, economy and culture), noting that evaluation systems in most national research funding bodies now require evidence of both. The United Kingdom Research Excellence Framework (REF) impact case study methodology, adopted since 2014, requires universities to document ‘reach’ and ‘significance’ of research effects beyond academia, establishing a precedent that African higher education systems, including Zimbabwe’s Education 5.0 philosophy, are beginning to adopt through their emphasis on industrialisation and community outreach.

Bornmann (2013) argues that widening the conception of research impact demands widening the portfolio of measurement instruments. A single metric, citations or otherwise, cannot capture the multi-dimensionality of research’s social contribution. This multi-metric imperative has driven the rise of altmetrics as a complementary measurement regime.

Altmetrics: Alternative evidence of research engagement

Altmetrics (alternative metrics) are counts of online attention and engagement with research outputs, including but not limited to: social media mentions on platforms such as X (formerly Twitter), Facebook and LinkedIn; downloads from repositories and open-access portals; blog citations; news media references; policy document citations; Wikipedia citations; and bookmarks on academic reference managers such as Mendeley and Zotero (Priem et al., 2012; Wilsdon et al., 2015). Tools including Altmetric.com, PlumX, ImpactStory and Dimensions aggregate these signals into composite attention scores.

The theoretical basis of altmetrics rests on the proposition that online attention signals precede, predict and sometimes substitute for formal citation impact, particularly for research targeting non-academic audiences (Thelwall et al., 2013; Bornmann & Haunschild, 2018). A community health worker sharing a research summary on WhatsApp, a policymaker bookmarking a policy brief on Mendeley, or a journalist citing a university research output in a national newspaper each represent forms of research engagement that citations entirely miss. In African contexts characterised by low scholarly publishing infrastructure, high informal digital communication rates and strong community radio ecosystems, altmetric signals may be more ecologically valid measures of research impact than citation-based metrics (Onyancha, 2015).

However, altmetrics have documented limitations. They measure attention, not use; they are susceptible to gaming; they privilege research in English on platforms with high Global North participation; and they are insensitive to the offline, oral and community-facing knowledge transfer that characterises much African university–community engagement (Haustein et al., 2014; Sud & Thelwall, 2014). A CaaS architecture, by embedding tracking capabilities within institution-controlled delivery channels, can supplement commercial altmetric tools with platform-specific, vernacular-sensitive and community-proximate impact evidence.

Content as a Service as a dissemination and tracking infrastructure

CaaS refers to a content delivery model in which digital content is stored in a decoupled repository and delivered on demand via Application Programming Interfaces (APIs) to diverse endpoints, mobile applications, websites, short message services, community radio scripts, vernacular audio files and digital signage (Benlian et al., 2018; Voigt et al., 2021). Unlike institutional repositories, which treat content as static objects, CaaS platforms treat content as active services whose delivery, consumption and re-use can be monitored in real time.

The CaaS architecture generates multiple layers of impact-relevant data as by-products of ordinary content delivery operations. Every API call leaves a log entry. Every download is a usage event. Every community feedback submission is an engagement record. Every content transformation. from journal article to vernacular audio summary, is a dissemination pathway event that can be time-stamped, geo-

tagged and linked to the source research output (Wang et al., 2014; Brennan & Lueck, 2018). When these operational data streams are directed into an impact monitoring layer, the CaaS platform becomes a passive research impact tracking instrument requiring no additional effort from knowledge generators beyond ordinary use of the platform.

Bibliometric analysis of Web of Science data (n = 393 publications on CaaS and knowledge management, conducted June 2023) reveals that while the volume of CaaS-related research has grown steeply since 2016, virtually none of this literature addresses the intersection of CaaS with research impact measurement (Mutindindi, Bwalya, & Khumalo, 2024). This represents a significant conceptual gap: the infrastructure for community-facing impact tracking exists within CaaS architectures, but no framework has operationalised this capability for the university community knowledge sharing context in Africa or elsewhere.

The Intention–Access–Impact Gap in African Universities

Empirical evidence from the UZ–BUSE DPhil study (Mutindindi, 2026) establishes a three-stage failure pattern that characterises research impact in Zimbabwean public universities. First, academics exhibit high knowledge-sharing intention: structural equation modelling confirmed that perceived usefulness significantly predicts knowledge-sharing intention ($\beta = 0.61$, $p < 0.001$). Second, an access gap intervenes: 69% of surveyed staff reported frequent barriers to sharing, including software fragmentation, bandwidth constraints and absent formal dissemination mechanisms. Third, an impact gap follows: communities remain largely unaware of university research, consuming information through informal channels (oral tradition, community radio, social media) that institutional repositories do not reach.

This three-stage gap has direct implications for impact tracking. If impact cannot be measured, it cannot be managed, rewarded, or reported to funders. Academics who invest in community-facing dissemination receive no formal recognition within conventional bibliometric systems. The result is a rational disincentive: why incur the cost of community engagement if there is no return to one's academic profile. A CaaS-based impact tracking system would close this perverse incentive loop by making community engagement visible, measurable and citable within academic performance frameworks. As Penfield et al. (2014) argue, impact measurement systems shape impact behaviour, what gets measured gets done.

Research impact and academic profile development

Impact evidence strengthens academic profiles across three career-relevant domains. For grant acquisition, funding bodies, including the National Research Foundation (NRF) in South Africa, African Academy of Sciences and international donors such as IDRC and Wellcome Trust, increasingly require applicants to demonstrate track records of societal engagement and research uptake, not just

publication counts (Grant & Booth, 2009; Research Councils UK, 2020). Multi-dimensional impact portfolios that include altmetric scores, community download analytics, policy engagement evidence and practitioner testimonials constitute competitive grant documentation.

For promotion and tenure, universities aligned with Education 5.0 principles and SDG-facing mandates are under pressure to recognise and reward community engagement, knowledge transfer and public scholarship alongside conventional publication metrics. A CaaS-generated impact trail provides the documentary evidence base for impact-inclusive promotion cases. For cross-sector collaboration, evidence that a researcher's outputs are being engaged with by NGOs, government departments, private sector actors and international development organisations creates the visibility that initiates partnership. CaaS delivery logs revealing that a research output has been downloaded by Ministry of Agriculture officials or shared by a rural extension officer are high-value collaboration signals invisible to standard bibliometric systems.

Research methods and design

Empirical basis

This article draws on primary empirical data from a study conducted at UZ (Faculty of Social and Behavioural Sciences, Department of Community and Social Development) and BUSE (Faculty of Social Sciences and Humanities) in Zimbabwe. The study employed a mixed-methods, retroduction-based design (RBD) action research approach, guided by Saunders, Lewis and Thornhill's (2007) research onion model. Ethical clearance was obtained from the University of Johannesburg College of Business and Economics Research Ethics Committee (Clearance Code: 2023SCiiS028).

Quantitative data: A validated Likert-scale questionnaire (n = 84) measured constructs including knowledge-sharing intention, perceived usefulness, user engagement, organisational support, community knowledge uptake and digital infrastructure readiness. Structural equation modelling (SEM) tested three hypotheses. Confirmatory factor analysis validated the measurement model (CFI = 0.94; RMSEA = 0.06).

Qualitative data: Twelve (12) semi-structured interviews were conducted with university administrators, librarians, IT managers, innovation hub management and community engagement champions. Interview data were analysed thematically using NVivo 14. A convergent parallel triangulation design consolidated quantitative and qualitative streams.

Framework construction methodology

The Research Impact Tracking Framework (RITF) was constructed using a three-stage approach. Stage 1: Empirical needs assessment, qualitative thematic analysis of interview data identified the specific impact signals that community stakeholders and academics considered meaningful evidence of

research uptake. Stage 2: Literature synthesis, a structured review of altmetrics, bibliometrics, CaaS architecture and research impact frameworks identified available indicator types and their applicability to the Zimbabwean context. Stage 3: Framework integration: identified indicators were mapped into CaaS delivery channels and organised into a four-dimensional impact typology (reach, engagement, uptake and societal change) using the payback framework (Martin, 2011) as a structuring organiser.

Ethical Considerations:

All research participants provided written informed consent. Data were anonymised prior to analysis. The study adhered to the 1964 Helsinki Declaration and University of Johannesburg ethical protocols. Ethics approval number: 2023SCiiS028. Institutional research permissions were obtained from UZ and BUSE prior to data collection. Community participants were represented through academically proxied interview data; direct community voice was captured through community knowledge champion interviews.

Results: The CaaS enabled Research Impact Tracking Framework (RITF)

Conceptual Architecture of the RITF

The Research Impact Tracking Framework (RITF) is a four-dimensional model that organises research impact evidence into hierarchically ordered impact tiers, each tier representing deeper community penetration and more robust evidence of research contribution. The four dimensions are:

1. Reach: evidence that research outputs have been delivered to, and received by, intended community audiences.
2. Engagement: evidence that recipients have actively interacted with the content.
3. Uptake: evidence that recipients have applied, adapted, or shared the content in their own contexts.
4. Societal Change: evidence that application of research knowledge has contributed to measurable improvements in well-being, capability, or development outcomes.

These four dimensions' map onto Martin's (2011) payback framework: Reach corresponds to knowledge production and targeting; Engagement to research capacity building among users; Uptake to informing practice and policy; and Societal Change to health, economic and developmental benefits. They also map onto the SECI model (Nonaka & Takeuchi, 1995): Reach supports Socialisation (tacit-to-tacit knowledge exposure); Engagement supports Externalisation (tacit knowledge articulated into engagement responses); Uptake supports Combination (explicit knowledge integrated with local knowledge); and Societal Change evidences Internalisation (knowledge embodied into changed practice).

Table 1
The CaaS-Enabled Research Impact Tracking Framework (RITF): Dimensions, indicators and CaaS delivery mechanisms

Impact Dimension	Tangible Indicators	Intangible Indicators	CaaS Delivery Mechanism
1. Reach	Download counts; API call logs; geo-tagged delivery events; SMS delivery confirmations; vernacular audio play counts	Awareness raised in target community; visibility of university research	CaaS Content Distribution module logs; mobile-first delivery analytics; community radio script request counts; USSD query logs
2. Engagement	Time-on-content metrics; community forum posts; Q&A submissions; feedback ratings; social media shares from CaaS portal	Stimulated community dialogue; changed attitudes toward research; peer discussion inspired by content	Social Group Management module; embedded feedback portal; CaaS discussion forum logs; Altmetric.com API integration; platform session analytics
3. Uptake	Content re-sharing events; practitioner downloads; policy brief citations; NGO adoption records; community radio rebroadcasts; vernacular re-translations	Community knowledge broker endorsements; practitioner testimonials; observed behavioural change linked to content	CaaS Content Routing module; API syndication logs to external platforms; community knowledge broker survey responses; NVivo-coded uptake narratives from interviews
4. Societal Change	Documented policy changes citing research; measurable community development outcomes; project funding secured using research evidence; employment or income changes attributed to knowledge	Community empowerment narratives; sense of agency; cultural affirmation; reduction in misinformation	Long-cycle follow-up surveys via CaaS portal; REF-style impact case studies generated from longitudinal CaaS interaction data; SDG contribution mapping module

CaaS delivery channels: Impact tracking capabilities

The CaaS architecture comprises six functional modules (Content Storage, Content Distribution, Content Processing, Content Routing, AAA Management and Social Group Management) each of which generates distinct impact-relevant data streams (Jin et al., 2012; Wang et al., 2014). The RITF harnesses these existing data streams without requiring additional data collection burden on academics.

Content Delivery Logs (Reach Dimension)

Every API call to the CaaS content repository creates a timestamped, geo-tagged delivery log entry linking a specific research output to a specific delivery event. In aggregate, these logs constitute a

‘delivery footprint’ for each research output: the number of times it was requested, the geographic distribution of requests, the device types used (mobile versus desktop, indicating socio-economic context), and the content format consumed (full-text article, vernacular audio summary, one-page policy brief, or video abstract). In the UZ–BUSE empirical context, where community members predominantly access information via mobile phones and prefer audio content in Shona and Ndebele, delivery logs for audio content files in vernacular languages constitute high-validity evidence of reach to intended community audiences, evidence that citation systems cannot generate.

Engagement Analytics (Engagement Dimension)

The Social Group Management module enables community forums, Q&A threads, rating systems and feedback portals. Each interaction event is logged with a user role tag (academic, librarian, community member, practitioner, policymaker), enabling disaggregated engagement analytics. A community member submitting a question about a research finding provides stronger engagement evidence than a passive download. A practitioner rating a research summary as ‘directly applicable’ provides stronger evidence still. When integrated with commercial altmetric tools (Altmetric.com or PlumX) through the CaaS API layer, these platform-specific engagement signals can be augmented with social media attention data, Mendeley bookmarks and news media citations. The RITF proposes a composite Engagement Score (ES) combining: platform engagement events (weighted 0.4), altmetric attention score (weighted 0.35) and qualitative engagement evidence from interviews (weighted 0.25).

Syndication and Re-sharing Logs (Uptake Dimension)

When a research output is re-shared from the CaaS portal to an external platform, a WhatsApp group, a community radio station’s digital library, an NGO’s intranet, or a government department’s policy portal, the CaaS Content Routing module logs the syndication event. These syndication logs constitute the highest-validity automated evidence of knowledge uptake because they indicate that a recipient valued the content sufficiently to share it forward into their own network. The RITF maps each syndication event to a dissemination tier: Tier 1 (shared within academic networks), Tier 2 (shared with practitioner networks), Tier 3 (shared with community networks) and Tier 4 (incorporated into policy or development project documentation). Tier 3 and Tier 4 syndication events constitute the strongest evidence of community-facing research uptake and are the most underrepresented in current academic impact measurement systems.

Long-Cycle follow-up surveys (Societal Change Dimension)

Societal Change evidence, the fourth and highest impact tier, cannot be generated through automated delivery logs alone. It requires longitudinal engagement with community users and beneficiaries. The

CaaS platform supports this through a built-in follow-up survey module that pushes time-delayed questionnaires (at 3, 6, 12 and 24 months post-delivery) to registered community users, capturing self-reported evidence of knowledge application, behaviour change and development outcomes. These survey responses, combined with key informant interviews conducted by researchers as part of the action research cycles, generate the qualitative and quantitative evidence needed for REF-style impact case studies, NRF impact reporting and SDG contribution mapping.

Empirical evidence: The Intention–Access–Impact Gap at UZ and BUSE

The empirical data of the study powerfully illustrate the need for the RITF. Under current dissemination arrangements, impact evidence at UZ and BUSE is not generated, tracked, or rewarded. The following findings corroborate this:

- Only 31% of surveyed staff (n = 84) rated their institution's current knowledge management ecosystem as satisfactory for community-facing dissemination.
- Zero respondents reported a formal mechanism for tracking whether community members had accessed, engaged with, or applied university research outputs.
- Qualitative thematic analysis (NVivo 14) identified 'lack of impact visibility' as the second most frequently coded barrier to sustained community engagement, cited by 8 of 12 interviewees.
- Community knowledge champion interviews confirmed that communities received research-related information primarily through informal channels (word of mouth, community radio, social media) with no traceable connection to university sources.
- A mid-career 'Trough of Disengagement' was empirically identified among academics with 6–10 years of experience: despite high early-career community engagement motivation, mid-career academics cited 'no recognition for community work' as the primary reason for disengagement.

These findings validate the RITF's core proposition: that the absence of impact tracking infrastructure is both a measurement problem and a behavioural incentive problem. Installing CaaS-based impact tracking addresses both simultaneously, generating the evidence and providing the recognition signal that sustains engagement behaviour.

RITF Application: Strengthening academic profiles

The RITF generates impact evidence that is directly applicable to three academic career contexts:

Grant Applications

The NRF's rating system, African Academy of Sciences fellowship criteria and major international funders (IDRC, Wellcome Trust, Gates Foundation) increasingly require applicants to demonstrate 'pathways to impact' and evidence of community engagement. RITF-generated evidence packs, combining delivery footprint data (Reach), engagement analytics (Engagement), syndication logs (Uptake) and longitudinal impact case studies (Societal Change), constitute precisely the documentary evidence these funders require. Importantly, this evidence is automatically generated by the CaaS platform during ordinary research dissemination activities, creating no additional administrative burden for the applicant.

Promotion and Tenure

Under Education 5.0 and SDG-aligned promotion frameworks, community engagement, knowledge transfer and public scholarship must be documented alongside conventional publication records. The RITF's four-dimensional evidence structure maps directly onto standard promotion portfolio categories: Reach evidences dissemination productivity; Engagement evidences public scholarship; Uptake evidences knowledge transfer; and Societal Change evidences development impact. Institutions can institutionalise RITF metrics within their promotion criteria as formal indicators of community-facing scholarship, creating the recognition structure needed to close the perverse incentive loop that currently discourages community engagement.

Cross-Sector collaboration

CaaS delivery logs revealing that a research output has been accessed by government ministries, international NGOs, or private sector entities constitute high-value collaboration intelligence. The RITF proposes an automated 'collaboration signal dashboard' that identifies non-academic organisations engaging with specific research outputs, enabling targeted partnership outreach. In the UZ–BUSE context, agricultural extension departments accessing soil science research or health ministry officials downloading community health intervention summaries are collaboration signals that the current IR infrastructure cannot generate.

RITF Implementation: Technical and Governance requirements

Table 2
RITF implementation requirements mapped to CaaS functional modules

Implementation requirement	CaaS Module	Impact dimension served	Governance requirement
API delivery logging with geo-tagging	Content Distribution	Reach	Data privacy policy; community consent for analytics
Embedded community feedback portal	Social Group Management	Engagement	Moderation policy; identity verification
Syndication event logging across external platforms	Content Routing	Uptake	API use agreements; intellectual property terms
Altmetric.com/PlumX API integration	AAA Management / external API	Reach, Engagement	API key management; data normalisation protocol
Longitudinal follow-up survey module	Content Processing / Social Group	Societal Change	Ethical re-consent at survey deployment; data retention policy
SDG contribution mapping dashboard	Content Storage / metadata layer	Societal Change	SDG taxonomy adoption; inter-institutional data sharing agreement

Discussion

The RITF as a response to Publish or Perish

The publish or perish system is not irrational, it exists because citation counts are measurable, internationally comparable and correlated with scholarly contribution to knowledge. The problem is not that publications are measured but that community-facing research contributions are not. The RITF does not displace the publication imperative; it extends the measurement infrastructure to capture the community leg of the knowledge dissemination journey. By making community-facing impact evidence as systematic, documentable and portable as a citation count, the RITF changes the rational calculus for academics: community engagement becomes measurable, rewardable and portfolio-building rather than invisible and career-neutral.

This reframing has deep implications for African universities operating under dual mandates, to produce internationally competitive research and to serve national development agendas. The Education 5.0 philosophy in Zimbabwe, which centres industrialisation and community impact as the fifth pillar of the university mission (alongside teaching, research, community service and innovation), creates an institutional framework that demands exactly the kind of community-facing impact evidence the RITF generates. Similarly, South Africa's NRF rating system and DHET subsidy mechanisms are evolving to place higher value on research impact beyond citation, creating structural incentives for universities to invest in impact tracking infrastructure.

Tangible and intangible impact

A persistent critique of impact measurement frameworks is that they privilege the tangible (measurable outcomes) over the intangible (narrative and relational contributions). The RITF explicitly accommodates both. The Reach and Engagement dimensions generate quantitative, automated data. The Uptake and Societal Change dimensions combine quantitative signals (syndication counts, follow-up survey scores) with qualitative evidence (practitioner testimonials, community empowerment narratives, longitudinal case studies). This multi-modal evidence architecture avoids the reductionism of pure citation metrics while maintaining the rigour that funders and promotion committees require.

Intangible impact, the sense of empowerment that a community derives from knowing that 'the university is researching our problems and making the findings accessible to us', is documentable through structured qualitative evidence collection embedded in the CaaS feedback portal. The RITF's longitudinal follow-up survey module explicitly prompts community users to narrate the 'difference it made', generating the testimonial evidence that impact case studies require and that no bibliometric system can produce.

Altmetrics in the African context: Opportunities and constraints

Commercial altmetric tools (Altmetric.com, PlumX) are calibrated to English-language, Global North digital ecosystems. In Zimbabwe, where research-community engagement occurs substantially in Shona and Ndebele through WhatsApp, community radio and oral knowledge broker networks, commercial altmetric tools generate systematically incomplete signals. The RITF addresses this by embedding platform-specific altmetric collection within the CaaS architecture itself, capturing the vernacular, informal and community-proximate engagement signals that commercial tools miss.

The proposed CaaS-RITF integration therefore constitutes a methodological contribution to altmetrics theory: it demonstrates that institution-controlled, vernacular-sensitive, community-proximate impact tracking is architecturally feasible and empirically necessary in African university–community research contexts. This finding extends Onyancha's (2015) argument for Africocentric research evaluation frameworks by providing a concrete technical mechanism through which such Africanisation can be operationalised.

Limitations and future research

The RITF is a conceptual framework grounded in empirical evidence from two Zimbabwean universities. Its applicability to other African higher education contexts, while theoretically defensible, requires empirical validation in diverse institutional, linguistic and infrastructural environments. Additionally, the governance requirements, particularly data privacy policies for community analytics and ethical re-consent for follow-up surveys, require institution-specific adaptation and regulatory compliance assessment.

Future research should also address the weighting structure of the composite Engagement Score (ES) proposed in this article, which was derived theoretically rather than empirically. Empirical calibration using expert panels and user studies would strengthen the ES's validity and generalisability. The integration of the RITF with national research information systems, including the NRF's Research Information Management System (RIMS) in South Africa and the Zimbabwe Research Council's databases, represents a productive avenue for institutional adoption.

Conclusion

An academic can publish and still perish if their research does not reach, engage, or change the communities it was designed to serve. The publish or perish system measures only one half of the knowledge transfer journey: the academic half. The community half, whether the knowledge arrived, was understood, was applied and made a difference, has been systematically unmeasured, unrewarded and invisible. Research impact tracking, understood as a return on public funding (Martin, 2011), requires infrastructure that closes this measurement gap.

This article has proposed and theorised the CaaS-enabled Research Impact Tracking Framework (RITF), a four-dimensional model (Reach, Engagement, Uptake, Societal Change) that harnesses the data streams inherently generated by CaaS delivery architectures to construct a multidimensional, multi-modal portfolio of community-facing research impact evidence. The RITF is grounded in empirical data from the University of Zimbabwe and Bindura University of Science Education, where a severe intention–access–impact gap was documented: high knowledge-sharing intention among academics, negligible community uptake, and zero formal mechanisms for measuring the distance between the two.

The RITF's theoretical contribution lies in three intersections: it extends Martin's (2011) payback framework into the CaaS architecture domain; it extends altmetrics theory into vernacular, community proximate African research ecosystems; and it extends CaaS theory from a dissemination model into a research governance instrument. Its practical contribution is equally significant: the RITF generates impact evidence that strengthens academic profiles for grants, promotion and collaboration without imposing additional data collection burden on academics, because impact data are generated as by-products of ordinary content delivery operations.

For information and knowledge management practitioners, research librarians and university leadership teams reading this article, the implication is clear: investing in a CaaS dissemination platform is not merely a content management decision. It is a strategic investment in the institutional capacity to demonstrate, document and reward research's contribution to the societies that fund it. In an era of heightened accountability for public research investment, that capacity is not optional, it is the foundational infrastructure of a sustainable, socially legitimate university.

Declarations

Funding information:

The author received no financial support for the research, authorship, and/or publication of this article.

Data availability statement: The data supporting the findings of this article are not publicly available due to ethical restrictions applicable to participants at the University of Zimbabwe and Bindura University of Science Education. Data are available from the corresponding author upon reasonable request.

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Author Contribution

This article is based on research originally conducted as part of Farai Sebastian Mutindindi's doctoral thesis titled 'Content as a Service fostering knowledge sharing amongst universities and communities', submitted to the Department of Information and Knowledge Management, School of Consumer Intelligence and Information Systems, College of Business and Economics, University of Johannesburg, in May 2026. The thesis was supervised by Prof. Kelvin J. Bwalya and co-supervised by Dr. Sithembiso Khumalo. The thesis was substantially reworked, revised, and extended with new conceptual content for this publication.

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Ethics consent to participate: Ethics approval number: 2023SCiiS028.

Ethics consent to publish: The author and the supervisors of the work have ALL consented to publishing this work.

Competing interests: The author declares that there are no financial or personal relationships that may have inappropriately influenced the writing of this article.

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