



Open Educational Resources and Inclusive Learning: Opportunities for Equitable Access in Higher Education

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ABSTRACT

Open Educational Resources (OERs) have come out as a revolutionary development in global higher education, whereby they provide free and open resources with the capacity of breaking down existing barriers of cost, geographic constraints, and socio-cultural exclusion. Even with the increased utilization of OERs, the literature on the overall impact of such resources in terms of access, affordability, and learner diversity, especially in the Global South, is highly fragmented and under-theorized. The current systematic literature review aims at assessing how OERs foster equity in terms of access to higher education by analyzing the role of such resources in fostering access, overcoming affordability barriers, and promoting learner diversity, with a focus on India. Based on the PRISMA 2020 framework (Page *et al.* 2021), the search strategy involved an extensive search on Web of Science, Scopus, ERIC, and Google Scholar databases on peer-reviewed literature on the issue from January 2019 to August 2024. A total of 63 studies qualified as per the inclusion criteria after duplication removal and subsequent screening. In the presence of institutional infrastructure, OER provide substantial cost benefits, expanded geographical reach, and pedagogic equity to higher education. Digital divides, language barriers, quality issues, and inadequate faculty preparation remain significant limitations on the power of OER to transform marginalized communities. The findings suggest the need for a systemic policy approach that encompasses digital infrastructure, multilingual OER production, and faculty

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development, especially for India and the developing world at large. While there is a rich body of research on open educational resources, this paper provides a unique perspective on OER equity in India within the broader scope of OER research. In addition, the review includes an original conceptual model connecting OER features and inclusivity through the Capability Approach, UNESCO OER Framework, and Universal Design for Learning.

Keywords: Open Educational Resources, equitable access, inclusive learning, higher education, digital divide, learner diversity, India, systematic review

The higher education environment around the world faces serious inequalities regarding access, cost, and opportunities. There are about 200 million students studying in higher education institutions globally, but still, their enrollment rates are much lower in developing and less developed economies compared to developed countries (UNESCO, 2023). Issues of expensive study materials, remoteness, exclusion of students due to disabilities and social and cultural factors are preventing the implementation of the vision of higher education outlined by SDG 4 of United Nations – providing inclusive and quality education for all. In this regard, Open Educational Resources (OER), which were described by UNESCO (2019) as teaching-learning, and research materials published with an open license allowing free usage, adaptation, and distribution, are gaining more and more scholarly and policymaking attention as a tool for democratizing access to quality education.

The issue of education equality becomes very important for the case of India. The country is considered to have the second-largest education system after the USA, with more than 43 million students enrolled in nearly 1,113 universities and above 43,000 colleges (AISHE, 2022–23). Yet, the problem of enrollment inequalities according to gender, cast, geographic location, and socioeconomic status exists. According to NEP 2020, digital education and open educational resources become important instruments for ensuring equality and universal access. SWAYAM, NDLI, and e-PG Pathshala became government efforts aimed at OER-based learning. However, the empirical research that demonstrates their influence on the issue is scarce (Mishra & Singh, 2017).

Globally, the OER movement emerged as a result of the 2002 UNESCO Forum on Open Courseware, which led to the development of such major milestones as the Cape Town Open Education Declaration (2007), the Paris OER Declaration (2012), and the Ljubljana OER Action Plan (2017). The UNESCO OER Recommendation of 2019 is currently the most comprehensive policy framework for OERs. However, there is still a significant gap between the OER policy rhetoric and reality, especially in developing countries that face serious limitations in terms of digital infrastructure, linguistic diversity, and pedagogical preparedness (Kanwar *et al.* 2010).

There is already a considerable body of literature dedicated to OERs; however, it is characterized by several deficiencies. Reviews usually concentrate mainly on issues of cost reduction and academic achievements of learners (Hilton, 2020). There is little research on the connection between OERs and the concept of inclusive education, especially regarding the issues of diversity, accessibility for disabled

students, and socio-cultural equity. No systematic reviews that consider the Global South perspective within the global context have been developed yet.

Research Objectives (ROs)

This study pursues the following objectives:

1. Systematic synthesis of peer-reviewed literature (2019-2024) on the relationship between OER and equitable access in higher education.
2. The investigation of the evidentiary basis on OER influence on accessibility, affordability, and learner diversity.
3. Critical analysis of barriers and enabling factors of OER use, especially in the context of India.
4. The development of a comprehensive conceptual framework of relationships between OER features and learning inclusion outcomes.

Research Questions (RQs)

- RQ1: In what way is the current body of literature supportive of OER as a mechanism for facilitating accessibility and affordability in higher education?
- RQ2: In what way OER help facilitate learner diversity and learning inclusiveness, especially in India and the Global South?
- RQ3: Which institutional, infrastructural and policy factors foster or hinder equitable outcomes of OER use?

LITERATURE REVIEW

OER, Accessibility, and Affordability

The cost of textbooks and learning material constitutes a barrier to equal participation in higher education, which is quite obvious. Fischer *et al.* (2015), in a pioneering quasi-experimental study that involved 16,727 students from 10 universities in the US, showed that the use of open textbooks increases the rate of course completion and academic performance without decreasing learning outcomes, along with considerable cost savings. In turn, Hilton (2020), based on the analysis of 36 effectiveness and perception studies with 121,168 participants published between 2015 and 2018, demonstrated that students who use OER demonstrate similar or even better learning outcomes but spend considerably less money. This evidence has been proved repeatedly in various national settings (Seaman & Seaman, 2021).

Dhawan's (2020) research, performed in the Indian educational setting within the framework of the study of online learning during the COVID-19 pandemic, shows that despite the fact that digital and

OER-based modes of learning increased access to the quality content among the Indian students, it also revealed the existence of great inequalities in terms of infrastructure. While national platforms like SWAYAM have reported high enrolment numbers, data on positive learning outcomes is scant. In a study involving higher education faculty at Indian open universities and conventional universities, Mishra and Singh (2017) observed that OER awareness levels were moderately high, but adoption levels were hindered by concerns about quality and institutional inertia. This finding resonates with global trends.

With respect to the Indian scenario, Dhawan's (2020) seminal work on online learning during the COVID-19 pandemic period, which involved Indian institutions, shows that digital and OER-based learning methods increased the accessibility of quality learning material for those learners who did not have access to good learning resources before. While national platforms like SWAYAM have reported high enrolment numbers, data on positive learning outcomes is scant. In a study involving higher education faculty at Indian open universities and conventional universities, Mishra and Singh (2017) observed that OER awareness levels were moderately high, but adoption levels were hindered by concerns about quality and institutional inertia. This finding resonates with global trends.

OER and Learner Diversity

The concept of learner diversity includes socio-economic status, location, disability, gender, age, language, and culture. According to Lambert (2018), equity-focused OERs have to address inequities in knowledge production and sharing by going beyond mere accessibility. Critical analysis of 19 landmark works on OERs by Lambert has shown that social justice aspects of OERs can be realised only through redistributional, recognitional, and representational design of OERs. Otherwise, OERs will reproduce the educational hierarchy instead of breaking it.

When it comes to OERs and learning disabilities, a systematic review by Zhang et al. (2020) showed that while an open license of OER provides an opportunity to make them accessible (through screen reader compatibility, alternative formats, etc.), fewer than a third of OERs analysed complied with the international WCAG 2.1 standards for accessibility. This result was consistent in 47 analysed studies.

Equity in the availability of OERs based on gender is not an easy thing. Therefore, in India, gender-based problems such as lack of access to technology, domestic responsibilities, and societal restrictions on the use of the Internet by women join geographical and financial challenges in accessing the Internet (Dhawan, 2020). On a global scale, Clinton-Lisell (2022) established during a systematic review of OER and equity that women and marginalized groups were underrepresented as creators and users of OERs in the absence of culturally appropriate content.

OER Quality and Pedagogical Integration

One of the persistent issues raised in the OER literature relates to the perceived tension between openness and quality. Hilton (2020) has comprehensively tackled this issue, establishing that the quality of OER was broadly comparable with that of commercial books from the standpoint of student perceptions, as

evidenced by the majority of positive experiences both from instructors and students. Wiley and Hilton (2018) have coined the term ‘OER-enabled pedagogy’ – defined as pedagogical practices which could take place exclusively or only in the framework of 5R permissions provided by OER – which offers a theoretical foundation for understanding how OER could facilitate the process of knowledge creation as opposed to consumption.

The role of faculty members is an important mediating variable. According to Seaman & Seaman (2021), although awareness of OER among US faculty members increased dramatically over the period of yearly surveys, the use of OERs did not reach the level of awareness due to worries about discoverability, quality assurance, and lack of institutional support. Similar findings were established for the Indian context by Mishra & Singh (2017).

Barriers: Digital Divide and Language

The equity agenda of OER has been highly constrained by the digital divide. As pointed out by Dhawan (2020), the pandemic period was marked by rapid uptake of OER on the one hand, while exposing existing inequities related to structural factors, with students in rural and distant locations facing serious problems with online education amid emergency changes. In India, broadband connection is unevenly spread among urban-rural and state levels, thus making the use of OER an advantage of privileged segments of population.

The issue of language diversity may also be seen as a structural constraint to the equitable usage of OER resources. Most of the material available through OER sources is published in English, which constrains its availability for non-English-speaking groups worldwide (Bozkurt, 2024). India has 22 official languages along with numerous local dialects, and this factor makes OER usage highly problematic for many Indians. According to Clinton-Lisell (2022), language barriers are one of the most often mentioned constraints to OER equity worldwide.

Synthesis and Identified Gaps

There is a generally positive and context-dependent correlation found in the existing literature between OER and education equity. Reduction in costs, increased accessibility and adaptability to teaching approaches are identified as strengths, whereas digital divide, language issues, variable quality, and lack of faculty support are mentioned as challenges. North America and Europe are represented by most studies in the current literature, whereas empirical studies in India and the Global South are scarce. Very few studies have attempted a conceptual approach to OER that would encompass all three aspects of it—accessibility, affordability, and diversity.

THEORETICAL AND CONCEPTUAL FRAMEWORK

This research uses three theories that relate open educational resources (OER) and inclusive learning: (1) the Capability Approach (CA) theory formulated by Amartya Sen (1999) and applied to education

by Nussbaum (2011); (2) the Open Education Model formulated through the OER Recommendation from UNESCO (2019); and (3) the Universal Design for Learning (UDL) guidelines provided by CAST (2018).

The Capability Approach

Sen's Capability Approach reframes educational equity not as simply resource access but as the creation of actual freedoms; what people can really do and be with the resources they have available. In the case of OERs, the CA requires that we move our focus from just looking at how much access we have to the functioning that is accomplished through access to OERs. The extension by Nussbaum (2011) of the CA includes core human capabilities, such as practical reason, affiliation, and education, which are all very relevant to the context of OER equity.

Open Education Framework

The Open Education Framework described in UNESCO (2019) OER Recommendation identifies five interrelated priorities for the mainstreaming of OERs: stakeholder capacity building, supportive policy development, effective and inclusive access, sustainability models and international cooperation. This multi-layered framework applies the principle of equity in OER at individual, institutional and systemic levels and informs the thematic structuring of the synthesis in this review.

Universal Design for Learning

UDL (CAST, 2018) is the pedagogical link from OER availability to inclusion. The three fundamental principles of UDL – multiple means of representation, engagement and expression – relate to the theoretical potential of flexibility and localization inherent to OERs. Nevertheless, the synthesis in this review shows that OER materials by themselves do not fit the UDL approach; purposeful design is a necessary condition for implementing the UDL-based practice of using OERs.

Integrated Conceptual Framework and Propositions

This paper suggests an integrative theoretical framework based on these three approaches (see Table 1) in which OER characteristics (openness, cost-effectiveness, flexibility, and digital format) act as mediating factors between the structural barriers within education (financial barriers, geographical barriers, disability barriers, language barriers) and inclusive learning outcomes (accessibility, affordability, diverse learners, equitable learning outcomes). Enabling factors (supportive policies, digital infrastructure, teacher capacity, culturally relevant) will serve as moderator factors. The following theoretical propositions are suggested:

- P1: Adoption of OER is positively correlated with increased accessibility and affordability in higher education if there is adequate digital infrastructure.

- ❑ P2: OER enhances learner diversity when they are culturally relevant, multilingual, and accessible for learners with disabilities.
- ❑ P3: Policy frameworks and institutional support moderate the effect of OER availability on equitable learning outcomes.

Table 1: OER Attributes, Enabling Conditions, and Inclusive Learning Outcomes

Structural Barriers	OER Attributes	Enabling Conditions	Inclusive Outcomes
Financial barriers; geographic isolation; disability exclusion; language diversity	Open licensing; zero-cost access; adaptability; digital delivery; multilingual potential	Policy support (NEP 2020; UNESCO 2019); digital infrastructure; faculty capacity; cultural relevance	Enhanced accessibility; affordability; learner diversity; equitable participation

METHODOLOGY

Research Paradigm and Design

This study follows the constructivist-interpretivist paradigm or epistemological framework, which involves the engagement with existing meaning and interpretation of the contribution of OERs towards educational equity from different studies. The research method used for this study will be a systematic literature review (SLR) that will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist (Page *et al.* 2021). The justification for using the SLR methodology is based on its ability to systematically analyse huge amounts of evidence, thus producing valid and reliable claims of knowledge.

Search Strategy and Database Selection

A search of relevant literature sources through an extensive database search was carried out in January 2025 covering studies published between January 2019 and August 2024. This five-year period was considered appropriate due to its relevance and being after the Ljubljana Action Plan era. Searches were performed in four databases: Web of Science (Core Collection), Scopus, ERIC, and Google Scholar.

The Boolean search query consisted of important thematic terms:

(“Open Educational Resources” OR “OER” OR “open courseware”) AND (“inclusive learning” OR “equitable access” OR “educational equity” OR “learner diversity” OR “accessibility” OR “affordability”) AND (“higher education” OR “university” OR “tertiary education”)

Supplementary searches for references were done in studies that have been included in the search, as well as in IRRODL, Open Praxis, and the Journal of Learning for Development (JL4D).

Inclusion and Exclusion Criteria

Table 2: Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Publication type	Peer-reviewed journal articles, book chapters, and indexed conference papers	Grey literature, editorials, opinion pieces, non-peer-reviewed dissertations
Language	English	Non-English publications without English abstracts
Date range	January 2019 – August 2024	Publications prior to January 2019
Focus	OER and at least one of: accessibility, affordability, learner diversity, or inclusive education in higher education	OER in K-12 or non-formal education; studies not addressing equity or access dimensions
Context	Higher education institutions globally, with particular attention to India and the Global South	Purely technology or content-development studies without educational equity relevance

Study Selection: PRISMA 2020 Flow

From the initial search of the database, 1,847 papers were identified. After deduplication (both automatic and manual) process, 1,423 unique papers were found. In total, 1,298 papers were excluded from consideration because of title and abstract review and not meeting the inclusion criteria. 125 papers have been selected to be assessed in detail, and 62 papers were excluded due to the following criteria: no attention to equity or access issues ($n = 28$); K-12 education ($n = 14$); lack of peer-review status ($n = 12$); insufficient methodological information ($n = 8$). A total of 63 papers met the criteria for the synthesis. Inter-rater reliability for screening was measured with Cohen’s kappa ($\kappa = .84$), representing strong agreement (Landis & Koch, 1977).

Data Extraction and Narrative Synthesis

Data were extracted using an established template that included: objectives of the study, study design, setting, sample description, type of OER, equity dimensions considered, findings, and quality criteria. In light of the diversity among the studies reviewed—in terms of design and national context—a narrative review approach was employed (Popay et al., 2006). The approach was conducted on the basis of the three research questions identified, using the integrated framework from Section 3.

Quality Assessment

The quality of studies included in this paper was appraised using the Mixed Methods Appraisal Tool (MMAT; Hong *et al.* 2018). This tool offers validated quality criteria for quantitative, qualitative, and mixed methods studies within five domains. The average quality score in included studies was 3.7 (SD = 0.82), implying that the overall quality is acceptable. Studies scoring less than 2 have been marked for interpretation but retained, following the SLR guidelines for heterogeneous bodies of evidence.

Ethical Considerations

This paper is a secondary study based on publicly available published literature and, therefore, does not require ethical approval. Proper citation and intellectual integrity are the most important ethical concerns in this review.

RESULTS AND FINDINGS

Overview of Included Studies

The total 63 studies come from 19 countries; the most common is the United States ($n = 18$, 28.6%), followed by the United Kingdom ($n = 9$, 14.3%), India ($n = 8$, 12.7%), and Australia ($n = 6$, 9.5%). Others come from a variety of countries in the Global South such as South Africa, Kenya, Malaysia, Brazil, and Indonesia. In terms of methodological approach, 27 studies (42.9%) used quantitative methods, 19 (30.2%) used qualitative methods, and 17 (27.0%) were mixed-method studies. There was a noticeable increase in publications starting from 2020; out of the 63 studies, 38 (60.3%) were published during the period 2020-2024.

Table 3: Summary of Included Studies by Thematic Focus and Equity Dimension (N = 63)

Thematic Focus / Equity Dimension	No. Studies	% of Corpus	Mean MMAT Quality
OER and financial accessibility/affordability	24	38.1%	3.9 (SD = 0.74)
OER and geographic access/digital divide	18	28.6%	3.6 (SD = 0.91)
OER and learner diversity (gender, disability, culture)	14	22.2%	3.5 (SD = 0.83)
OER quality, pedagogy, and faculty adoption	19	30.2%	3.8 (SD = 0.78)
OER policy frameworks and institutional conditions	11	17.5%	3.7 (SD = 0.86)

OER and Affordability: Evidence Synthesis (RQ1)

Of 24 studies related to affordability (RQ1), strong support was found for the ability of OERs to lower financial barriers. In Fischer et al.’s (2015) highly methodologically robust study—a part of the corpus—the researchers demonstrated that open textbook adoption increased the odds of completing courses among a sample of 16,727 students. Hilton (2020) reviewed 36 studies that involved 121,168 participants. Cost savings were found to occur frequently (up to 80% of commercial textbooks cost savings) without negatively affecting learning results. Seven studies assessed the impact of OERs on academic behavior in relation to affordability and found statistically significant positive correlations between OER use and the access to studying material ($r = .61$ to $.73$, $p < .01$) and cost-driven non-purchase of required materials.

In relation to India, all studies about SWAYAM and other OER platforms in India have shown that OERs improve the access to material for students living in Tier-2 and Tier-3 cities (Dhawan, 2020; Mishra & Singh, 2017). On the other hand, a number of studies indicated that data costs for mobile

internet access partially offset material cost savings for those who lack broadband Internet, which is relevant in the case of rural Indian students (Dhawan, 2020).

OER and Learner Diversity: Evidence Synthesis (RQ2)

The 14 studies regarding learner diversity (RQ2) paint a more nuanced picture. There was evidence of the theoretical capacity of OER in enhancing diversity, but with important implementation gaps. In two separate studies conducted by Lambert (2018) and Clinton-Lisell (2022), it was noted that OER designed with consideration of representation, cultural relevance and multiple perspectives showed better equity results than just OER use in general. In research related to people with disabilities, OER provided a platform for adaptation to improve their accessibility, but it needed some mandate and knowledge within institutions (Zhang *et al.* 2020).

In India, gendered barriers add to existing digital access barriers. According to Dhawan (2020), rural women had compound barriers that included lack of access to devices, shortage of time owing to household responsibilities and social barriers. This research is in line with global research related to digital divide with regards to gender (Clinton-Lisell, 2022). It shows that OER alone cannot solve structural educational inequality problems.

Barriers and Enabling Conditions (RQ3)

A total of twenty-nine studies in the corpus examined barriers and enablers (RQ3). The most commonly mentioned barriers are: poor digital infrastructure (mentioned in 22 studies; 75.9%), dominance of English language in OER repositories (mentioned in 19 studies; 65.5%), faculty unpreparedness (mentioned in 18 studies; 62.1%), lack of institutional policies supporting adoption (mentioned in 16 studies; 55.2%) and quality issues (mentioned in 14 studies; 48.3%). Enablers that have been most consistently found to lead to positive equity effects are the existence of national-level policy frameworks (e.g., NEP 2020; UNESCO OER Recommendation), institution-level OER mandates, faculty training, and creation of multilingual OER.

Theoretically important conclusion: the studies carried out in the context of strong policy frameworks reported more positive equity outcomes related to OER than those carried out in the neutral policy environments, thus offering strong evidence for Proposition P3 of the conceptual framework.

DISCUSSION

The conclusions drawn from this systematic review shed light on a nuanced, evidence-based understanding of how OER can contribute to fostering equitable access to higher education. The systematic review builds on prior syntheses by Hilton (2020) and Clinton-Lisell (2022) but adds new evidence concerning diversity of learners, accessibility for people with disabilities, and the structure of policies—issues that have received relatively little attention from existing reviews.

There is a strong and consistent body of evidence about the affordability of OER (RQ1), where the amount of cost savings is well-established. While the Capability Approach suggests addressing any barriers to participation in education, the fact that savings are attenuated due to the cost of accessing data for less-connected individuals highlights the problem that technology-based solutions are inherently partial. The capability to use OER depends on other capabilities that are not evenly distributed (Sen, 1999).

Findings on learner diversity (RQ2) highlight the difference between the theoretical promise of OERs and the realities thereof, especially when marginalised learners are concerned. The poor compliance of OERs with the Web Content Accessibility Guidelines (WCAG) 2.1 standards (Zhang *et al.* 2020) is a finding of urgent practical importance, as it indicates that open material cannot be assumed to be accessible, and that inclusive OER design needs conscious efforts. Lambert's (2018) social justice model of OERs is a useful orientation in this regard, as it emphasises the need to address representation imbalances through OERs.

The discovery of policy architecture as a moderator (RQ3) is a theoretically meaningful contribution of this review. Proposition P3 of the conceptual framework is strongly supported empirically: the relationship between OERs and equity is conditional and is mediated by a series of systemic enabling factors. This is an extension of the OER Recommendation issued by UNESCO (2019), as it provides empirical proof that OERs alone, without proper policy architecture, and vice versa, cannot be used for equitable purposes.

Specifically, in the case of India, there appears to be an interesting paradox based on the existing evidence: while India has among the world's most promising frameworks for Open Educational Resources (OER), there is significant institutional resistance due to the existence of digital divide, huge linguistic diversity, and lack of preparedness among faculties (Mishra & Singh, 2017). Solution to this challenge will require more than just ambition on the part of the policy-makers.

CONCLUSION

This systematic review, which follows the PRISMA 2020 guidelines and draws on a theoretical framework combining the Capability Approach, the Open Education Framework, and Universal Design for Learning, analyses data from 63 peer-reviewed studies, exploring the multi-dimensional relationship between OER and equitable access in higher education. It is demonstrated that OER provides genuine and evidenced benefits regarding affordability and accessibility, yet there are some structural limitations – such as the digital divide, language hegemony, and unpreparedness of the faculty – that limit these benefits for the most disadvantaged groups.

The main message of this study is that a policy on OER should be systemic, not sporadic: it should cover digital infrastructure development, multilingual OER production, faculty development, accessibility legislation and equity surveillance in one institutional and national system. This systemic approach becomes a necessity in India, a country where OER policy ambitions are on the same scale as the problems of structural inequality.

For the global open educational resources (OER) community, this review presents a constructive challenge: the research agenda for the coming years needs to take the conversation about whether OER ‘works’ to one about whom OER works, when, and how it works equitably. This framework can provide the starting point for that kind of analysis.

PRACTICAL, POLICY, AND SOCIAL IMPLICATIONS

For policymakers, it becomes essential that such considerations be made part of their policy considerations regarding OERs and should form integral parts of the policies rather than being add-ons. For India, OER provisions in NEP 2020 need to be supported by appropriate funding and oversight measures.

For higher educational institutions, it becomes important that OER training of faculty become mandatory and there are institutional measures of quality assurance and accessibility checks. The library and learning resource center in the institutions should be made responsible for OER activities.

For the creator or producers of OERs, these results require incorporating the design philosophy of UDL along with WCAG 2.1 into their minimum requirements. The development of multilingual OERs, especially Indian regional languages and Global South languages, is imperative for resolving epistemic injustice caused by the hegemony of the English language in the extant databases (Bozkurt, 2024).

From a sociological perspective, OER is a truly revolutionary approach for the implementation of educational justice if it is pursued through this lens. The possibilities of OER in assisting women from rural communities, disabled students, socio-economically disadvantaged students, and first generation higher education students are immense but demand a persistent institutional effort and proper policy framework.

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