Indispensable Necessity - Researchers' Digital Identity: Special Reference to ORCID ID

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Abstract - *In last two decades research and number of researcher also increased day by day as the technology remove the boundary barrier of information access. The researcher must be cite the research article which used by them in the research work. But ambiguity in name is one of the big challenges while citation and citation analysis too. As the various naming style exist worldwide and with the different naming style it becomes more difficult to count the citation credit. Unique identification to a researcher give the solution of this name ambiguity and give proper citation record and mange the whole research contribution of researcher on a single platform. Non-profit community driven ORCID, Inc provides the ORCID - Open Researcher and Contributor ID the unique research identification to a researcher, and linking the researcher research contribution with other IDs. It kept not only the contribution record of researcher but also useful to researcher for job profiling, for project funding and as well useful to the publishers, organization, funding agencies, government to keep track on researcher contribution toward subject. The paper describes the features of identifiers and point out the requirements of identifiers adoption in special context of ORCID. Worldwide numbers of researcher register in ORCID by individual or via consortia base. In India individual researcher register in small number in compare of numbers of Indian researchers, but not any consortia till register in ORCID from India. The Government and private Funding agency, Education Commissions, Education committees, Organization, nation information center like INFLIBNET have to be develop a proper system for uplift the researcher's registration in Open source unique identifier ORCID.*

Introduction:

Now a day with web evolution and academic development, numbers of researches are increasing day by day. Publication, distribution and accessibility of information scored higher and higher records with advantage of new technologies. Web technology of linking opened broad opportunities by means of research work accessibility and acknowledging to the work of researcher. The ideology is that any research work should be available to access from anywhere and anytime it could be referred or cited. Every research has the two basic units, a 'research article' and 'referred articles' and both contain the name of researcher. To connect the referred or cited article or published article by the name of researcher is the big challenge as the varied naming styles of researcher, followed by the centuries across the world varied by cultures, journals, organizational level. There may be cultural differences in the order of

First name, Middle name and Last name. Name contains the inconsistent use of abbreviations by the different styles of naming. It is also difficult to collect manage and represent the whole contribution of a researcher toward their subject area. To identify a researcher, to collaborate the research work of a single one researcher is almost the difficult task. Names are in various formats, in various publication platforms which creates the ambiguity. Here the 'name' indicates the name of the researcher of a work and name of researcher who's works referred by researcher to support their work. Name ambiguity makes the confusion to researcher, publisher, database producers, funders, librarian, bibliometric publications to find out the works of named person. As we know in India there are different naming styles changed state by state, they write the spelling of name as their pronunciation e. g. Agarawal, Aggrawal, Agrawal, Aggarwal, or sing, singh, sinh. In northern states of India they use the first name suffixes as the middle name abbreviations, e.g. Stayendra Singh Rawat written as S. S. Rawat while in South India they use the village name in their name abbreviations.To avoid this type ambiguous issue and variation in naming style, requirement rise to develop a unique identity of a researcher which should be easily acceptable and adoptable by the worldwide community. These unique identities know as Unique Author Identifiers. Identifiers can increase the usage of existing research as well the increase the demand of new research.Collaboration, accessibility, citation, citation analysis, career development graph and project approvals by funder become valuable and can be managed swiftly with Unique Author Identifiers.

Researcher Digital Identity: Indispensable Necessity

Researcher is the term generally used for the subjective publication authors so here the unique author identifiers term can be replace by the unique researcher identifiers. The unique identity to a researcher may establish their identity uniqueness and contribute to make possible the collaboration of their career output on a single platform. Very earlier Garfield (1969) pointed out his anxiety at the 'needless ambiguity and Confusion' caused by researcher who omits parts of their names and initials in the publications, they recommend that 'scientist who are just now embarking o their careers would be well advised to measure the information content on their names as they appear in indexes such as index, Medicus, Physics abstract, biological abstract and science citation index'. Garfield (1981) mentionedstudy in his article, in period of 1965 to 1978 the 945 research articles used 'T SUZUKI' under author term and cited over 7300 times, at that time 'T SUZUKI' adopted by 25 different researchers as author term in SCI. Thus it becomes difficult to find out and credit out the right author.

The proper identification to a researcher required so any can access the whole research of a researcher with single identity and its known as 'unique researcher identifiers'. Identifiers provide a digital identity to a researcher, which distinguished them from other researcher and develop appropriate linking between researchers and the research activities. Researcher, scientist, scholars, teachers, students or anyone can associates their research output, education details, employment details and details related their collaborators.

Nowadays many countries take initiatives in implementation of unique author identifiers, with support of consortia, publishers, government bodies etc. The organization/s demands a track of publications, research output and project details in employing process to evaluate and analyze the research activity of the person. The most accurate data may retrieve with a single click from a single identification on single platform and save the time, if the person has the

unique identifier. It save the time of researcher to re-keying the information on multiple forms and minimized the error risk.

Review of Literature:

Wolinsky(2008) mentioned the fundamental role author id, that any universal author id system weather it is database or the networks belongs to community and they have to make sure about the of database have to careful about and giving credit where credit is due. Fenner (2011) reviewed many of author id which are majorly adoptable unique identifiers such as AuthorClaim by Open Library Society developed in 1999, LATTES introduced in 1999 by National Council of Scientific and Technology Development - Brazil which is mandatory for Research in Brazil, VIAF developed by Online Computer Library Center – OCLC in 2003, NARCIS organized by RoyalNetherlands Academy of Arts and Sciences of the Netherlands, 2004 is mandatory for all researchers, ArXiv Author ID developed by Cornell University for researchers in Physics, Mathematics and Computer Science related disciplines, launched in 2005, Scopus Author ID by Elsevier commercially launched in 2006, Names Project by Mimas-British Library for researches and Institutions introduced in 2007, Research ID launched in 2008 by Thomson Reuters on commercial basis, ORCID launchedin 2009 by ORDIC, inc, PubMed Author ID maintained by National Library of Medicine – United Sates is Covers only Life Science.

Worldwide many more unique identifiers acceptable such as Google Scholar ID, ResearchGatewhich works as social networking site and many more available. All have the specific features and limitation. Major of them are limited to specific boundary. The most limitation is, it cover ups limited land area or subject area, some of them for specific subject, some of them are for specific country, some of them developed as propriety some of them are in collaboration with specific database, some of the are commercial some of them have government holding. Out of these many are accepted and adopted by researcher worldwide, but universally acceptance and adaptation is not possiblefor all by their various limitations.At present the out of them some trending uniqueresearcher Identifiers which gain the worldwide acceptanceand overcome the issue of ambiguity in author name and give the accurate credit to researcher and are ‘ResearcherID’,‘SCOPUS Author ID’ and ‘ORCID ID’. These are adopted highly by the researcher funders, research Institutes, publishers, employing organizations and by the government bodies.

Fundamentally all these three,ResearcherID, Scopus Author ID and ORICID IDare have almost the same aim, to resolve the ambiguity for researcher’s identity and gives unique identity by linking their work with their unique identifiers. However in the functionality there are minor differences between the characteristics, features and limitations which play the major role in selection to adopt either any of them or all of them.

Scopus Author ID – An Overview

Scopus Author ID is another identifier developed by Elsevier in 2006, used specially by the Scopus and their products. It differentiates distinguish names by providing a unique number to each author in Scopus and makes a group of all the documents written by that author. The Scopus author profile offers a variety of author metrics such as List of author's publications indexed by Scopus, number of co-authors, citation and citation by documents, h-index, etc. There are many services like Citation Alert Service (to follow a researcher), to add citations

to ORCID (integrated and updated ORCID ID) etc. By using a Scopus Author Identifier, seeker can be sure to found the correct author, even if an author is cited differently.

Scopus Author Identifier helps distinguish researchers with common surnames or last name, such as Smith, singh, Lee, by returning list of possible author matches to their affiliations of organizations, research and subject areas of interest. With algorithmic functionality it define the researcher on the basis of their last name, middle name, First Name, organization affiliations, city, country, source titles, publications citation, co-authors etc. algorithmic action finds different naming style of cited authors and put them under a oneroof of unique identification. However the problem with SCOPUS is that if the document does not match with an identifier, the algorithmic action grouped it separately. It possibly creates another record entry as new one for the already exist author in Scopus data.

A Scopus author ID available only if a researcher work published in a Scopus indexed journal. Scopus work on commercial basis and provided registration is via institutions and organizations. Individuals can access a preview mode to view what publications and authors available on Scopus, but full access not provided towards.

ResearcherID – An Overview

ResearcherID is a unique identifier system for scientific researchers,developed by Thomson Reuters used in Web of Science, introduced in January 2008. It allows researchers to manage their lists of publications and can track cited articles in time. It can avoid erroneous identification of the author regardless of institutional affiliation allowing researcher to easily track their research. A ResearcherID number is an alphanumeric characters and each ID contains the year of registration. Researcher can register their self freely and can opt the unique identification number 'ResearcherID'. e.g. Monika Hestad - designer and researcher haveResearcherID K-8011-2013.

ResearcherIDgives the complete illustration of the whole research production of an author.Researcher can use their profile and be sure that they correctly credited for their work in Web of Science.Cals&Kotz (2008) brought out benefit that it should consider as an initiative to solve the common problem of misidentification of authors.Advantage brings some drawbacks by self.Wolinsky (2008) pointed out that it was charged by Peter Binfield, Managing Editor of PLoS for being commercial and proprietary and they draws attention in requirement for the acceptable open source identifier that everyone can access.

ORCID ID – An Overview

ORCID - Open Researcher and Contributor ID, introduced as a non-proprietary unique author identifier for academic authors and contributors, which offers independently registry on open access basis and give the unique identification to researcher in research and academic publishing. The ORCID initiative begins in 2009 and was moved a step ahead, converted in nonprofit organization in August 2010.It is an independent nonprofit organization, certified as incorporated by Delaware, United States of America in August 2010 named ORCID, Inc., with an international board of directors.

ORCID started issuing the identifiers with launch of registry in October 2012. According to Gasparyan(2014)it is the first non profit and non proprietor establishment who take initiative for unique identifiers by 'Open Researcher Contributor Identification Initiative'.It is

alphanumeric code which gives the unique identity to researchers and contributors.ORCID IDs specified as URI by a 16-digit number compatible, following standard ISO 27729 E.g. Monika Hestad the ORCID is http://orcid.org/0000-0002-7646-2506. Both the hypertext transfer protocols http:// & https:// supported by ORCID. Any individual researcher can register free of cost and can obtain the ORCID ID, but it is paid for organizations.

Suitable, acceptable and Sustainable ID - ORCID ID

ORCID ownership plays an important role in their worldwide acceptance. ResearcherID and Scopus Author ID are proprietary IDs while ORCID not owned by a publisher, it is almost as the firstopen registry for Researcher/Contributor Identification. Community-driven organizationORCID, Inc. works with teams ofworldwide representatives such as funderslike Welcome Trust, publishers like Thomson Reuters, Wiley-Blackwell, Nature Elsevier and universities like Cornell MIT, Barcelona and many others.ORCID, Inc. visionary sight aim to connect the participant of research, scholarship, and innovation work across the world must be uniquely identified.

To analyze the publication of a researcher from different database such as web of Science, SCOPUS etc.become time consuming for both researcher and analyzer as it is not ease to collect, manage or analyzing the different list of publication of single author. But by the putting the ORCID ID in identifier field gives less time consuming instant access of research output in a unique required format. ORCID provides a vast collection with support of central registry of identifiers of individual researchers via transparent link-up mechanism in between ORCID ID and other currently exist unique identifier IDs. ORCID has a function of import export datain supportsof other unique identifier systems such as Scopus ID, ResearacherID, Kudos, Loop, Mendeley, or Publish Researchfish, British Library for their EthOS thesis catalog, ProQuest for their Dissertations and Theses Service, Frontiers Loops etc. ORCID easily grab bibliographic details of scholar publications and automatically update publications list via unique identifiers e.g. DOI, ISBN from the list of databases integrated with ORCID registry. The list includes Scopus, Web of Science, DataCite, Europe PubMed Central, Crossref Metadata Search, Redalyc, etc.

According to the statistics displayed as on December 11, 2017, Total 4,171,754live ORCID iDs registered and till increasing day by day. Total 2,072,225 educations affiliated, 1,671,579 employments affiliated, 370,154 funding activities support ORCID and more than 10,495,179 Unique DOIs registered in ORCID as on December 08, 2017.

ORCID IDis a specified as URIs. e.g. http://orcid.org/0000-0002-7646-2506 can view without login if ‘public’ by researcher. ORCID helps to manage and demonstrate researcher’s research works as well professional affiliations and contributions in areaare visible to other. However, Information sharing restriction feature gives control in ID holder hand via Privacy setting. Digital identifier owner can manage own account via ORCID Registry.Works on both, http:// and https://encrypted communication protocols.Social media profiles can also to be connect with ORCID ID.

Now a day’s many publishersdemanding to authors for ORCID ID at manuscript submissions stage, and the result is, out of total registration of 2016, 75% of registrations required ORCID ID ate manuscripts level.Haak (2015) stated in open letter that More than 3,000 journals already demanding and collecting ORCID IDs from respective authors, publishers in all

major publications while manuscript submission process. Publishers are in the unique position to taking ORCID ID on new heights.

Auto update is one other best feature of ORCID. While submitting the manuscript, the publishers ask to mention the author's ORCID ID. ID holder may grant the approval, Publisher embedded ORCID ID associated data in an article if the article is accepted for publishing.CorssRefgenerate a doi of the published article and publications metadata received from the publisher via the doi, ORCID updated it to respective ID. ORCID Registry updated with the publications information in less than a day without the single key hit by researcher.

Meadows (2017) blogged out the facility to access of Public API (Application Programming Interface) for non register organization members and Member API for to the subscription based organizational members. ORCID registry can connect to their systems and applications via machine-to-machine communication. System or application, using the Public API, local users sign in to your system with their ORCID username and password, get their authenticated ID. They can performsearch in ORCID registry and retrieve public ORCID record in machine readable format JSON or XML.

ORCID concentrated on organization's identifiers to disambiguate institutions in the affiliations section. Data filled up by researchers required employment and education affiliations on the records, included the institution's name and address as well. To avoid institute name ambiguity a unique identifier ORCID take the institute name data from the institute name database Global Research Identifier Database-GRIDwhich provides research organization and academic institute database and Ringgold, both provides institutional identifiers record. ORCID used both to affiliate the institute or organization of individual researchers.

Ambiguity in funder agency may become the insolublebut ORCID focused on this issue too. ORCID collaborates with Crossref to use the Fundref Registry. While adding funding activity to a record, at funding institution's name, a pick-list popup for funding organizations sourced from Fundref-Funder Registry, which has taxonomy more than 5500 global government and private funding organizations.

Most of the journals' peer review process done behind the stage and final article popup to readers. Haak (2014) mention the announcement of ORCID planed for concrete work to structure a working group by the ORCID peer review action in collaboration with F1000Research - Open platform for Research Publishing and CASRAI - Consortia Advancing Standards in Research Administration Information in 2014. After successful outcomesORCID started open peer review process for evaluating the journal article for publication, conference paper, grant proposal and many others, with support of F1000Research in 2015, provides the more transparency to research as well reviewing process. Author can justify their written record and develop more solid revised version of writing.In traditional behind the stage peer review process only author and editor aware about referees role while in this open platform peer review, reviewer get the credit of their peer reviewing efforts. ORCID, CASRAI, F1000Research and other partners of ORCID implement a peer-review citation standard' for collect store and exchange the peer review data on researcher ORCID record. In 2016, ORCID introduce the functions for researchers to access their ORCID account through their institutional registration login.

Academic institutions and their members can manage, maintain and update their academic reputation by building e-portfolio to automatically update their ORCID record when publishing, by using ORCID iD at submitting stage.More than 25,000 ORCID users have linked their accounts to approximately 725 institutions around the world.

In Openletter ORCID, Incclaimed35 major journals publishers give signatories confirmation. They take initiatives to motivate the community, including researchers, funders for research and research institutions for the adoption of ORCID. The Royal Society, PLOS, eLife, EMBO Press, American Geophysical Union, IEEE, Hindawi, Science journals, Science Open Frontiers, JMIR Publications,GeupoComunicarEdiciones, Military Technical Coueier, The Company of Biologists, Instututo de EstudiosAvanazados - IDEA, Universidad deSantiago de Chile - USACH, Faculty of 1000, Japan Epidemiological Association, Rockefeller University Press, The Journal of Bone & Joint Surgery, Skyfox Publishing, Wiley, Royal Society of Chemistry, Americal Chemical Society Wellcome Open Research, INFORMS, Springer Nature, Journal of IMAB, IOP Publishing, American Physical Society, ActaPaulista de Enfermagem, Neotropical Ichthyology, Nauplius, Neuroscience Bulletin, Social Sciences Academic Press from China and Neural Regeneration Research, make mandatory to all authors who wish to publishing in their journals may have an ORCID iD.

The paid-in services concept implemented by ORCID on consortia based organizational membership. In joint of 5 or more non-profit and/or governmental organizations adopt consortia based membership. Currently 20 consortia are register under this. Consortia, including research institute and government bodies look forward to implementation of ORCID at a national level in developed country.

The Nonprofit Consortium Cineca - Government Consortia, collaborated in Italy under the patronage of the Conference of Italian University Rectors -CRUI and the National Agency for the Evaluation of the University and Research Institutes - ANVUR, represents Ministry of Education, 70 universities, and 4research institutions.

In Australia, Australian Access Federation - AAF is registered as consortia member in 2015, includes various Australian universities. The government's National Health and Medical Research Council - NHMRC and Australian Research Council - ARCencourage all researchers who apply for funding to have an ORCID identifier.In UK, 'JISC UKORCID consortium' of Research Councils UK, makes ORICD identifiermandatory from 2016.Canadian Research Knowledge Network-CRKN take membership in May 1, 2017 and build ORCID-CA, the ORCID consortium in collaboration with 16 Canadian stakeholders and 22 organizations joined the 'ORCID-CA' consortium.

Other consortia membership registered like Big Ten Academic Alliance from United States, National Center for Systems and Services for Research and Studies- CERES from Norway,IT Center for Science Ltd. - CSC From Finland, Denmark's Electronic Research Library - DEFF from Denmark, Digital Science from UK, Elektron VZWfromBelgium, Greater Western Library Alliance – GWLA from United states, Health Research Alliance from United States, Lyrasis from United Sattes, National Chiao Tung University from Taiwan, NorthEast Research Libraries -NERL from United States, Royal Society TeApārangi from New Zealand, SUNET from Sweden, SURFmarket from Netherlands, TechnischeInformationsBibliothek-TIB from Germany, TENET from South Africa are playing the major role in ORCID implementation in respective countries.

In compare of proprietary IDs which link the contribution or publishing published by their respective journal publications, ORCID allows any contributions and works, publication from any publisher. It fulfills their mission statement "open tools that enable transparent and trustworthy connections between researchers, their contributions, and affiliations".

Worldwide usage of ORCID map

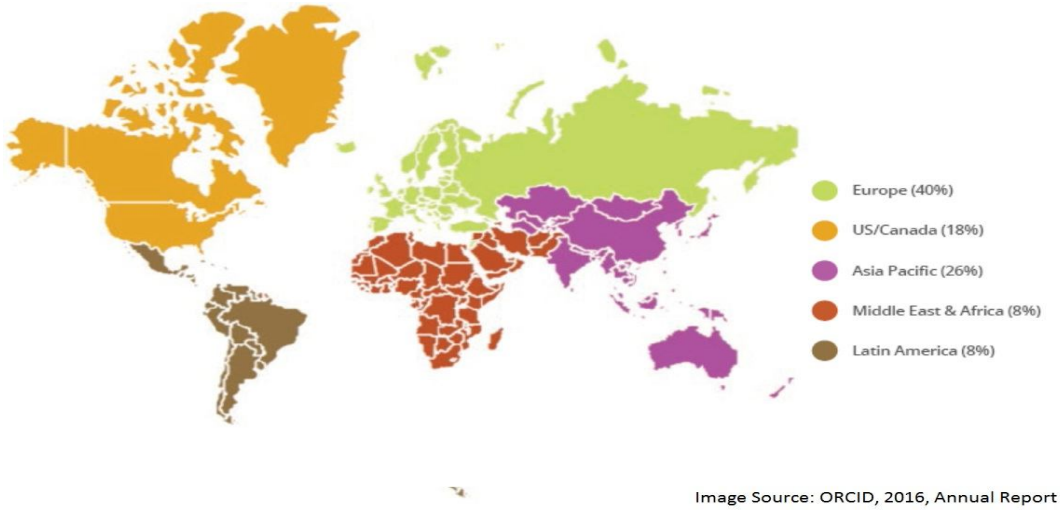

Image Source: ORCID, 2016, Annual Report

As per the ORCID Annual Report 2016 usage statistics, highest 40% usage noted from Europe while lowest 8% usage from Latin America. Map indicated in developed country ORCID acceptance and usage is higher in compare of developing country. 26% share is of Asian Region in ORCID.

Worldwide IDs of ORCID ID

Sr. No.	Name of Country	Register IDs
1	United States	2,055,868
2	China	1,011,736
3	United Kingdom	888,478
4	India	666,593
5	Spain	658,542
6	Brazil	563,333
7	Italy	558,763
8	Australia	402,862
9	Portugal	392,785
10	Germany	391,433

(Source : ORCID, 2016, Annual Report)

United States is on the top with 2,055,868 records and India is in on the 4th number in worldwide. China is on the top with 1,011,736 users in Asian Region as in Asian region only the China adopting ORCID consortia. With of ORCID registry India is on the 4th number.In India individual users separately registration put India on the 4th in the list 666,593 records but not any consortia formed for ORCID. On the base of mail communication there is not any India organization membership register with ORCID with the headquarter place in India. Howe ever the website analytics report shows 40,000 to 50,000 individual users accessing in India, hence India is in the top 5 in ORCID nation wise user statistics chart. (Mail

Communication dated December 15, 2017). It shows,ORCID is not widely picked up in India.

Conclusions

Unique researcher identifiers is the solutions of Complex issue 'ambiguity in author name', with positive side effects such as measurable efficient improvements reordered and benefits increasing steadily after implementation of unique author identifiers, especially in data quality, publications management, citation analysis, reporting to funders.

Unique author identifiers ensure researcher that the publications and outputs are precisely recognized, and become useful is newresearch for publishing, analyzing accessing, citing as well to past research. Developing country funding agencies required to take initiatives in way to implementing and integrating their funding system with open unique identifier ORCID. Government, funding agencies such as University Grants Commission - UGC, private research fund provides, educations organizations, information research centers such as INFLIBNET required to take strong steps toward implementing and adopting the unique author identifierORCID ID. It should become indispensable necessityfor recruitment of researcher and funding of research project by analyze the track of research work flow of individual or institutes.ORCID will helpful to researchers, scientists, scholars, teachers to produce their research activity and progress via single one click for performance measurement in career advancement.

Any researcher according to their requirement may need to sign up for ORCID ID and even can go for all three ResearcherID and Scopus Author ID and ORCID. It is easy to link-up the works by interconnecting the differ identifiers. Automatic data transfer of publications action based on computerized transformation gives any time worldwide access of the complete and most accurate data of researcher activity.

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