

Scholarly Communication Cycle: SWOT Analysis

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ABSTRACT

Communication (formal/informal) is the key for making society attentive and advance scholarly communication (SC) worldwide openly. Components of SC (accumulation, creation, evaluation, publication, dissemination and preservation) are cycling towards elevation of education, research and innovation. Stakeholders have critical role in managing the SC cycle. In this study, SWOT analysis is used to evaluate strengths, weaknesses, opportunities and threats of SC and its components emphasizing the internal and external ecosystem. Based the SWOT analysis, the stakeholders potentials, resources, drawbacks, advantages, risks etc. are drawn in order to make strategic decisions to manage system effectively. Results revealed that accumulation of resource infrastructure facilitations brings an idea into creativity, reviewed it for quality, originality and publication (stamp of validity) that was disseminated through various media & modes and preserved for longevity. Imperatively, the SC carries authenticity and recognition globally. It also shown that an inactive infrastructure, mentorship and policies often indulge scientific creativity through misconduct and biased decisions of reviewing make futile or fake publication that will always spoiling the system. Taking opportunities to create and access resource repositories, helping to publish research to innovation monetize into products marketing globally with cloud safe and security. Finally, handicap of intellectual infrastructure vacuum (brain-drain) pressures the academia to leap into predatory journals crediting no transparency and accountability.

Keywords: Scholarly Communication; Education, Research and Innovation; SC Cycle; Components of SC; SWOT.

1. Introduction

Communication is a medium of language disseminated through its formal (making public) and informal (signs, symbols, verbal, writing, e-mail, pre-prints, etc.) channels. A formal communication is explicit and more authenticated to record knowledge, ideas, research findings etc. At the same time, informal communication is rapidly growing, shaping uncertainty about quality control (Meadows, 2003). Often, codified and tacit knowledge cyclically combined in the process of interactive learning and knowledge creation (Howells, 2002). Publishing codified knowledge (as a resource) carries authenticity and recognition. Therefore, scientific journal plays a central role in scholarly communication (SC) domain. It is not only a primary source of formal information, but also structured in scientific way to showcase research results. It provides a stamp of validity (Tandon, 2014). However,

“information overload and rapid increases in costs” (Meadows & Buckle, 1992), quality of content and other legal aspects challenge in the formal communication system.

Internet and web 2.0 technologies shape the communication more lively and interactive using social network tools such as blogs, wikis, facebook, twitter, tagging etc. Each one is having unique applications to post and communicate information, images, videos etc. for various purposes. Al-Aufia & Fultonb (2014) found that, “there is perceived usefulness on the impact of social networking tools on patterns of informal SC.” As of today, the SC becomes easily accessible and available in many flexible formats due to online transition and the exploration of new publishing models like open access (Ware, 2015).

2. Scholarly Communication

SC is system, aiming to enhance organizational knowledge triangle– education, research and innovation (Gannon, 2006). “A scholarly research (which is a by-product of SC) is created to facilitate inquiry and enhance knowledge” (Sawant, 2012). Core functions of the SC are “registration, certification, dissemination, archiving, and rewarding” (Ware, 2015). SC is transforming and sharing knowledge (Parekh, 2009). Indeed, three stages of SC process drawn by the Graham (2000) are informal networks, public dissemination (conferences and preprints) and formal communication (research publication). Now, the SC becomes social process where social networking tools help in discovering sources of research dissemination. “Transformation of knowledge, so rapid and so dramatic, that there has been very little opportunity to assess, adjust, and respond to the impact on SC” (Fidishun, 2010). However, “the use and creation of social media does not adversely affect the use of traditional scholarly materials but, improves its penetration” (Tenopir, Volentine & King, 2013).

2.1 Definitions

- “SC is all about creation, dissemination and preservation of scientific knowledge” – *Halliday (2001)*.
- “SC is the system through, which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use.” - *Association of College & Research Libraries (2003)*.

2.2 History of SC

In the early seventeenth century, new research ideas, observations, experiments etc. often made available through formal communication channels such as scientific letters, anagram (*a sentence announcing a discovery that was encrypted*), periodicals, even newspapers etc. Broadly, these methods used to communicate

research, scientific news, establish facts, a priority of discovery (Meadows, 1974). In the mid-seventeenth century, there was a move for establishing learned societies such as the Royal Society (founded in London in 1660 and chartered in 1662). Henry Oldenburg (*the first Secretary of the Royal Society*) proposed the way of disseminating and verifying new discoveries in science. “He created the world’s first scientific journal - “*Philosophical Transactions of Royal Society*” in 1665 with a simple goal: apply an emerging communication technology - the printing press - to improve the dissemination of scholarly knowledge” (Priem, 2013). “Pioneered the concepts of scientific priority and peer review, which together with archiving and dissemination of the journal became a model for almost 30,000 scientific journals today” (Royal Society, 2015). “Since then, structure of the scientific work has been respected the basic paradigms “introduction, methods, results and discussion – one of humanity’s oldest formats” (Barraviera, 2015). It was a truly decisive model for scholars worldwide to exchange ideas, establish originality and assess their works.

In 1970s, the word SC has gained popularity worldwide. Establishment of new libraries, increasing number of scholars and expansion of publications were emerged. In the year 1974, “material costs and overheads rose at an annual rate of something like 30% and circumstances affect publishing generally, and academic publishing faces a crisis” (Black,1974). The 1979 report of the “National Enquiry on SC” used as a starting point to elevate at greater level today. During this time, there are concerns about certain practices of scholarly creation, publication and copyright. Thus, a new approach of disseminating science was an electronic media during 1980s. British Library awarded a grant to Loughborough University to establish an experimental online journal in the areas of *computer human factors* with a motto to substitute print (Shackel, 1991). Later, a first refereed scientific electronic journal (*new horizons in adult education*) introduced in 1987 to accept, referee, edit, and archive articles electronically. In the 1990s, electronic publications became important and their impact was questionable to consider it, a scientific journal. “Vancouver Group clarified that any electronic publication made available on the Internet constitutes a publication” (ICMJE, 2015). Since then, print and electronic journals are flourishing to communicate scholarly content. “In 1995, there were about 100 electronic journals in the world” (Aboukhalil, 2015). Since then, the number of referred academic journals from 24,000 to 29,000 in 2014, and is growing each year (Seethapathy, Kumar & Hareesha, 2016).

1.1 Objectives of the Study

The objectives of the study are as follows:

- Describing introduction of SC;
- Assessment review of literature;
- Using logical methodology;
- Role of SC cycle and its components;
- Application of SWOT analysis; and

- Building strategic decisions and conclusions.

2. Literature Review

Literature on communication modes (formal/informal), SC and its cycling process was widely acknowledged. As stated by Shehata, Ellis and Foster (2015 & 2017), there are three types of communication modes (*conventional, modern and liberal*) and further, three behavioural approaches such as *Orthodox, Moderate* and *Heterodox* that scholars adopt in the SC process. “Internet for communication and therefore the electronic format has affected scholarly publication, especially concerning availability and accessibility” (Bjork, 2004). “The social and interactive web is expected to affect the SC process where research dissemination becomes increasingly informal, interactive, and part of a much larger public than earlier” (Widen, 2010). Numerous studies (Meadows, 1992 & 2003; Mark, 2007; Cullen & Chawner, 2011; Romary, 2012; UNESCO, 2015; Finlay, Tsou & Sugimoto, 2015; Xia, 2017) highlighted about SC and its components such as accumulation, creation, evaluation, publication, dissemination and preservation, challenging today in making scientific research worldwide openly.

Indeed, scientific progress is constituted by the accumulation of knowledge (Bird, 2008). According to Xia (2017), “decisive impact on scholarship creation that requires researchers to be original and innovative instead of merely recording, reciting, and regurgitating what teachers have lectured.” Evaluation mainly peer-review system is the best portion of SC, which needs a high quality of attention from receipt of article by a journal to publication. Tan (2018) highlighted “past, present, and future of peer review.” “Assessment is a valid tool for managing quality and reviewers' reports using computational approaches” (Sizo & Others, 2018). “Web 2.0 has affected the way of disseminating of knowledge” (Sawant, 2012). “Semantic web technologies have influenced the current methods of describing, identifying, disseminating, and retrieving information” (Bountouri, 2017). “Digital information is more complex than the print and problems of preserving print materials—acid papers and embrittlement—will seem trivial by comparison” (Marcum, 1996). Further, it is to understand “the fabrication of these objects better and to find the best conditions for their storage and display in order to preserve them for future generations” (Bell, & McPhail, 2007).

Indeed, stakeholders hold critical role in managing the SC cycle. Libraries (cultural heritage of content) are consumers of SC and they become more active in the production of scholarly materials (Sullivan, 2013). In the SC system, stakeholders are central in planning and performing their functions effectively using organizational strengths, weaknesses, opportunities and threats (SWOT) analysis. It is a “strategic management technique” (Sevкли et al., 2012). “Initially experiment it in business context” (Samset, 2010). Now it spreads in many sectors. A number of studies (David, 2009; Helms & Nixon, 2010) stated that the SWOT is a logical

approach that helps to assess internal and external ecosystem to draw strategic decisions.

3. Methodology

Scholarly Communication as system influences the academic and publishing industry. Components of SC and its cycling process with stakeholders' relationship intensify the best education, research and innovation. A methodology adopted for this study is SWOT analysis. "It is a simple, qualitative, generally applicable method" (Samset, 2010). It is used to describe SC components in four quadrants (strengths, weaknesses, opportunities and threats) of two dimensions (internal and external). This technique helps to "plan, assess and predict the provisions for benefiting SC" (Helms & Nixon, 2010). Limitations of SWOT analysis are "often improperly used to justify complacency and verify current practices" (Gurel & Tat, 2017).

4. Scholarly Communication Cycle – Components

The SC facilitates and makes the scientific education, research and innovation progress. The SC cycle (**Figure-1**) consists of various components such as accumulation, creation, evaluation, publication, dissemination and preservation. The process of SC involves "copyright, journal pricing, managing of data sets, digital preservation and open access" (Mark, 2007). Major issues technical (functional solutions), economical (includes the future and economic viability of institutions in the information chain), legal (especially copyright and IPR) and behavioural (acceptance of digital formats) often challenging the stakeholders to proceed SC cycle into action (Owen, 2007). As mentioned by the Keenum & Shubrook (2012) there are areas of originality, structure, language, and ethical concerns need a lot of attention. "Research on faculty values and needs in SC that confirm a number of conservative tendencies in publishing. These tendencies, influenced by tenure and promotion requirements, as well as disciplinary cultures, have both positive and negative consequences" (Harley, 2013). Increased intellectual property rights (IPR) protection is associated with knowledge accumulation (Ang, 2010). IPR will increase the rate of innovative activity through the provision of an environment conducive to the accumulation of knowledge (Gould and Gruben, 1996). Although, the future shape of SC in institutional repositories (IRs) remains unclear because of its lack of contribution by the stakeholders.

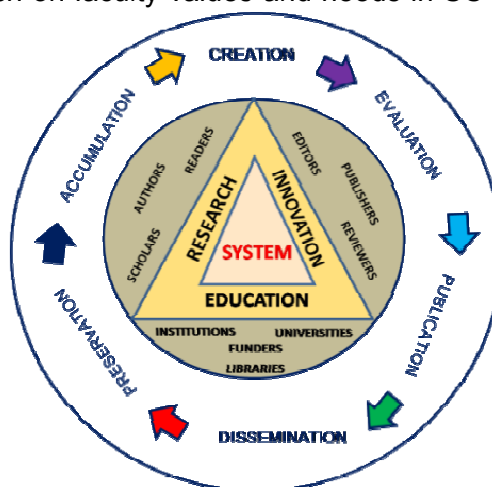


Figure 1. Scholarly Communication Cycle

4.1 Role of Stakeholders

As a system, the SC cannot be appreciated without the role of stakeholders and their interdependent relationships and responsibilities. In a system, they often perform tasks and face challenges. The SC is embedded in structures of relationships with other. (Borgman, 2000). According to Shearer & Birdsall (2005) “the traditional/formal process of SC consists of four major groups of players (researchers, publishers, libraries and consumers/users) with different roles”. “Scholars have a unique role in the process of scientific communication, often acting as reader, author, and referee, frequently as editor, and also as organizer of conferences, schools, and workshops that result in scientific publications (Ginsparg, 1996).” “Libraries close connections with other stakeholders in the SC process, including expertise in digital initiatives, and a commitment to preservation, content acquisition, editorial management, contract negotiation, marketing, and subscription management.” (Thomas, 2006). Publishers acquire, manage and market content, administer royalties, copyright, licensing, piracy and protection, warehouse operations and relationships among stakeholders. Most funding agencies understand the fact and they have implemented policies to ensure the publications that result from the research they fund are freely available (Solomon 2014). Similarly, all communities have equal role to disseminate knowledge whether it is acquiring skills, writing techniques, logical arithmetic and simulation modelling etc. (Venkataraman, 1998). Each one plays a fundamental role to adopt ethics, honesty, integrity and transparency in the system. According to Ann J. Wolpert (2013), there are “five active stakeholder communities below have contributed to the system that enables the production of peer-reviewed research literature for the past 60 years.”

- **Funders** – grant funds to undertake research;
- **Organisations** – host intellectuals, provide infrastructure facilities and inspire to facilitate academic, research and training.
- **Scholars** (content creators) – read, write, translate and evaluate and publish scholarly research for greater visibility without expecting monetary benefits.
- **Publishers** (make, manage and market content) – invite and accept papers, do editorial process and invest on publication production, distribution and copyright transfer globally.
- **Libraries** (treasure of resources) – historically acquire, organize, disseminate and preserve content (print and electronic) and facilitate and provide services to their clients for current and future teaching and research.

4.2 Accumulation of Scientific Knowledge

This facilitates scholars in learning, understanding and resuming/redoing research & development (R&D) process. There are couple of factors: preparedness and infrastructure that strongly influence the scholars in the production and diffusion of

knowledge. Firstly, awareness to create, collect, connect and collaborate knowledge resources reside in multiple locations, available in flexible formats stimulating to do hard-core research. Accumulation of creative knowledge and high external technology search intensity jointly to increase the outcomes” (Choia, Shinb & Hwangc (2018). According to Fisherman (2012), “culture, economics of intellectual resources and IPR” are seen as infrastructure to stimulate socially inclusive and fiscally sustainable society. Therefore, institutional knowledge base is necessary to increase efficacy (Dierickx and Cool, 1989). Accumulated and acquired knowledge resources and services intensify the performance of scholars towards creativity, innovation and technology transfer.

4.3 Creation

Creation originates from cognitive process of human intellectuality, helping to produce new set of knowledge(Wink, 2007). Factually, creativity is generally less ordered, structured, and predicted and quite opposite to regular process (Xia, 2017). In order to inculcate culture of creativity and innovations (artistic, designing, critical thinking, writing, communication, experimentation, etc.), there are three main paths: individual experience and knowledge acquisition; individual communication and reflection; and organizational knowledge learning (Li, Liu& Zhou, 2018). At the same time, institutional efforts, capital and labour enhance the creativity and innovation. Further, institutions adopt various best practices, policies and strategies to encourage scientific culture by offering academic incentives including awards, rewards, cash prizes and promotions. Ultimately, the creativity and innovative works are protected by IPR laws for a particular period of time.

4.4 Evaluation

Evaluation is an assessment for quality and accuracy. A scholarly publication needs various stages of evaluation especially in the editorial process. After submission to a journal, preliminary assessment (style, scope and content) by the editor decides its qualification for space in a journal including tracking system. Advance technologies and techniques including artificial intelligence (AI), machine learning and plagiarism are used to find quality, originality and authenticity check (Sizo & Others, 2018; Lee et al., 2018). “Peer review is an essential component of scholarly publishing” (Mulligan, 2005).Three types of the peer review (single blind, double blind and open) system in general. “Peer review is critical to the journal, and remains widely supported despite some robust criticism” (Ware, 2015).There are couple of critics or concepts in the peer-review system such as ‘*fit for purpose*’ and ‘*publish & filter*’. Merit based review processes adhere to highest standards with integrity. Decisions in the manuscript selection process are on purely on credentials. For instance, *Science (one of highest impact factor journals worldwide)*,”now accepts less than 7% of the original research papers submitted and about 80% are rejected during this initial screening stage, because of the stiff competition for space in the journal”. At the same time, an ensuring mechanism for

how to find and deal scientific misconduct (whether they are reliable, authenticated or reproducible, fraud etc.) in SC. However, this criterion includes ethical concerns related to the checking of references, conflicts of interest, the detection of plagiarism and redundancies (duplicate content), as well as other issues that depend on the type of study (Rosenfeld, 2010). Impact factor measures research output and discloses the credibility of journal. But, sometimes it is “crude and also misleading” (Nature, 2016). “Publish & perish” is one of the challenges that mount academic pressure to accelerate publication eventually. Further, “policymakers read the contents of published papers and not just count them” (Rochmyaningsih, 2017). After the peer review process, the reviewer remarks over the paper. Based on, the judgment will be awarded by the editor. “It is an explicit judgement which asks whether the research addresses a relevant and significant issue in its field of study, and whether it has the ability to advance or positively impact science” (Drotar, 2008). The judgments whether the paper may be accepted, rejected, revise and resubmit with minor or major corrections.

4.5 Publication

Publishing is a process of acquiring, planning, packaging, advertising, marketing the print and digital content. According to Association of American Publishers (2016), “publishers of 28,000 journals published 2.5 million articles and 5 million drafts submissions in a year globally and 3% annual growth of active researchers and number of articles published.” “Publishers invest a large proportion of funds on designing, graphics, copyediting, proofreading, printing, archiving, digitizing, distribution, marketing, online hosting etc, but often publishing costs are hidden” (Rao, 2017). Quality and integrity of publication heightens the business latitudes. “Public communication is a one of the ways to expand journal readership and attract advertising revenue” (Nelkin, 1998).

In the publishing industry, there are economic models from subscription to open access, change the costs of publishing. These models: reader pays model(subscription model) and author-side pays model(new model) sound differently. In the subscription model, publishers generate 68-75% revenue from libraries and often through sub-models such as content bundles (Ware and Mabe, 2012). From the author-side pays model (mainly open access journals), funders and institutions pay on behalf of scholars and “an average cost *article processing charges* (APCs) to an article is \$3,500–4,000” (Noorden (2013). “Open access-publishing model makes the research permanently visible and accessible, with sustainable development” (Chang, 2006). However, Publishers estimated a profit margin is at 20–30%. Majority of publishers adopt innovative technologies, techniques and best practices into system with utmost accuracy and transparency. However, a few publishers produce predatory journals (also called *fast-track publications, pseudo-journals, and fake journals*) that predominantly spread worldwide aiming to generate income by various means. The main pressure for

publishing papers in international journals (whether it is commercial/open access/predatory) is academic evaluation practices in the academic system of a few countries. Retraction Watch reported that “the number of articles published by predatory journals spiked from 53,000 in 2010 to around 420,000 in 2014, appearing in 8,000 active journals and average APC fee is \$178.” Finally, a publisher brings a publication with a layout and design with correct proof editing and format, references, plagiarism detection, metadata, discovery service and publishing. Post-published works involve updation and corrections, usage metrics, citations, IPR protection, archiving, migration and platforms.

4.6 Dissemination

This is a process of delivering scholarly content (print and electronic). Overriding motto is to publicize research accessible openly. Dissemination of research results are often objective, connecting people largely. As quoted by Daniel J. Boorstin “Knowledge is never used up. It increases by diffusion and grows by dispersion.” Thus, the dissemination of scholarly content benefits socially and fiscally. Bruce Austin, Director of RIT Press stated that “the inspiration, motivation, indeed the reason for research, is discovery. But, without dissemination of research, has no use” (Raffaella 2014).

In the era of digital transformation, a variety of approaches (either by electronic or print) to disseminate scholarly content through formal/informal channels by means of publications, patents, designs, slideshows, e-mail, listservs, audio-video, webcasts, networks, radio, television, forums, social media etc. (Edwards, 2015). Dissemination of printed materials limits largely due to cost-benefit analysis. According to Paperwork Reduction Act of 1995, USA, aimed at encouraging electronic media. As of today, the social media tools (facebook, twitter, youtube, flickr etc.) played an extensive role to evaluate and disseminate impact of scholarly content. Increased adoption of Twitter as a channel to disseminate scholarly literature than other the social network sites (Moriano, 2014). Stakeholders aspire openness and fairness in content accessibility and dispensability. A legitimate dissemination of content supports the stockholders to fulfil their motto of social and economic benefit. “Factually, the IPR laws bring stable, safe and sustainable ecosystem over intellectual products, processes and services for the sole benefit of the society.” (Rao, 2014).

4.7 Preservation

It is a technique for protecting and safeguarding the treasure of resources (print/electronic) residing in multiple locations/databases (local/remote). Main objective of the stakeholders is to preserve collections (paper, books, manuscripts, photographs, audio-visual, datasets etc.) for longevity, facilitating search and retrieval. Priority of preserving content is for discoverability, accessibility and

sustainability. Preservation protects and saves from various threats (environment, fire, water etc). Three areas concern in digital preservation: technical issues, organisational issues and legal issues (Moghaddam, 2010). Various types of issues involved in digital preservations. A document of copyrighted materials (books/journals/report/digital copy) in flexible formats (doc, pdf, html, e-pub etc.), stored and preserved in multiple locations and avail/access through multiple platforms. Mainly three centres (libraries, publishers and archives/repositories) hold a key to preserve and disseminate digital scholarly content. For centuries, libraries stored and preserved content (*print, digitized and born-digital*) for social benefits, while publishers shown fiscal benefits. Concerning to archives/repositories such as Portico (JSTOR -2002) and LockSS (1999 by Stanford University) etc., hold and manage third party content digitally. Model of **Portico is a true** archive aiming long-term preservation (expensive digital resources), whereas, LockSS is real-time archive aiming to access whenever publisher sites are unavailable or during the period of downtime. However, there is need of series of awareness programs, standards, policy formulations and legislative framework to digitize and preserve heritage materials (Kalusopa & Zulu, 2009).

5. SWOT Analysis

Since 1960s, the SWOT technique has been practicing to evaluate organisational structure and performance. The SWOT is a simple strategic method used for delivering improved decisions. "It is also a powerful tool for sizing up an organization's resource capabilities and deficiencies, its market opportunities, and the external threats to its future" (Thompson et al., 2007). Hence, this method was chosen in order to address internal and external of positive negative consequences. The internal forces cover strengths and weaknesses of system including infrastructure, human resources, finance, output etc. The external forces cover opportunities and threats for instances ecosystem, economic possibilities, social cultural, legislative and technological changes and competitors, (Tuncay, 2015). Simple definitions of SWOT mentioned below:

- Strengths– "capabilities and resources of the organisation" (Thompson et al., 2007)
- Weaknesses – "deficiencies of the organisation" (Thompson et al., 2007)
- Opportunities – "situation or condition suitable for an activity" (Gurel, & Tat, 2017)
- Threats– "situation or condition that jeopardizes the actualization of an activity" (Gurel, & Tat, 2017)

Table 1. SWOT Internal and External Forces

Internal Forces		
Strengths – Positive		Weaknesses – Negative
Accumulation	<ul style="list-style-type: none"> • Aspiration to communicate scholarly research • Space for studying, learning, and sharing • Do and redo research and discover resources • Production and diffusion of knowledge 	<ul style="list-style-type: none"> • Inadequate preparedness, plan and procedure • Missing academic standards and guidelines • Mediocre experience and experimentation • Lack of continuously efforts
Creation	<ul style="list-style-type: none"> • New and originality of research findings • Research into innovation and products • Protection of IPR 	<ul style="list-style-type: none"> • Mass copying and copyright violation • Scientific misconduct and plagiarism • Lack of institutional research base
Evaluation	<ul style="list-style-type: none"> • Assessment for originality and quality • Peer-review and impact of journal • Best practices and high standards 	<ul style="list-style-type: none"> • Ineffective manuscript tracking system • No evidence-based and biased assessment • Inconsistency decisions and services.
Publication	<ul style="list-style-type: none"> • Abstraction of research into reality • Acquisition and publishing models • Copyright and license agreements • Accountability, citation, recognition, visibility 	<ul style="list-style-type: none"> • Monopoly over publication prices • Inappropriate business models • Lack of funders • Surrender copyright/licensing
Dissemination	<ul style="list-style-type: none"> • Knowledge sharing and transferring • Greater accessibility, flexibility and usability • Wider publicity and marketability 	<ul style="list-style-type: none"> • Abundant of information • Unreliable and unauthenticated sources • Inappropriate formats
Preservation	<ul style="list-style-type: none"> • Content accessibility & durability • Management and protection of data • Licensing and copyright materials 	<ul style="list-style-type: none"> • Deficiency in managing content and funds • Ineffective discovery and recovery • Lack of safe and secure server system

External Forces		
Opportunities – Positive		Threats – Negative
Accumulation	<ul style="list-style-type: none"> • Avail and access resources • Intensifies scholar performance • Build intellectual research repositories 	<ul style="list-style-type: none"> • Damage of academic research culture • Insufficient resource facilitations and funds • Handicap of expertise and experimentation
Creation	<ul style="list-style-type: none"> • Novel visualization to do research • Monetize products, processes and services. • Licensing agreements • International recognition and collaboration 	<ul style="list-style-type: none"> • Intellectual vacuum (brain-drain) • No priority of discovery/research • Ineffective real-time and local-need research • Inadequate policy formulations
Evaluation	<ul style="list-style-type: none"> • Assess quality and originality • Open review and decisions • Benchmark high standards in policies 	<ul style="list-style-type: none"> • Influenced peer-review and prejudice • Fabrication of data and plagiarism • No usage metrics
Publication	<ul style="list-style-type: none"> • Ownership of data • Award degree, cash incentives and promotions • International acclamation and visibility • Anticipate maximum returns on investment 	<ul style="list-style-type: none"> • Skyrocketing of journals prices • Fast-track publishing • Predatory or fake journals
Dissemination	<ul style="list-style-type: none"> • Publicize content through formal/informal media • Accessibility of local and remote resources (digitized and born digital) • Mobility to transfer data in flexible formats 	<ul style="list-style-type: none"> • Difficulty to control social network sites, • Obsolete of digital materials • No interface for discovering digital materials • No control over digitization and privacy
Preservation	<ul style="list-style-type: none"> • Management of knowledge repositories • Longevity and timely accessibility • Effective interface and discovery system • Centralised cloud resource management 	<ul style="list-style-type: none"> • Lose data and no mirror back-up data • Obsolete infrastructure and metadata standards • Cyber threats (virus, bugs) and hacking. • Shortage of funds

4. Strategic Directions

A few directions, helping the stakeholders to their routine SC and publishing processes:

- Accumulation of knowledge resources including intellectual infrastructure facilitations encourages SC culture through means of *awareness, availability and accessibility*.
- Upliftment of SC (creation and innovation) activities often rely on *best practices, mentoring, experimentation, policies and funding*.
- Exercising a stringent evaluation system shapes the SC (research findings) in more *accurate, ethical, legal and high standards in quality, originality and its impact*.
- Publication brings research into reality of *ownership, recognition, royalties, incentives and promotions*
- As result, a volume of published research available in various formats and databases/repositories (local/remote), disseminating through formal/informal channels including social networking sites for *greater mobility, usability, flexibility, publicity and marketability*.
- Intent of preservation is to keep scholarly content *available, accessible, transferable, portable, protectable and durable*.

5. Conclusion

Communication is tool to disseminate explicit and tacit knowledge combined in the process of interactive learning and knowledge creation. Legacy of learned societies exhibit their discoveries and research findings through a scientific journal establishing stamp of validity and originality. Web.2 technologies disseminate research accessible openly. SC as system and its components are indivisible, relying on each other helping stakeholders to facilitate inquiry and enhance knowledge through series of cycling processes. Therefore, SWOT analysis undertaken to estimate strength, weakness, opportunities and threats of SC process. Based on the SWOT analysis, conclusions are drawn for guiding the SC cycling process. Organisational infrastructure and preparedness are mounting to accumulate knowledge. Uniqueness in the innovative process is practically advancing the level of knowledge into publication. Standardized peer-review, advanced technologies, best policies, practices and ethics in SC bring scholarship culture and ownership. Publication of research holds citation and recognition worldwide. Dissemination of research into innovation brings social, fiscal benefits and globally competitive. Priority to preserve scholarly content (print/digital) is discoverability, accessibility and longevity. This study also need further research to meet the SC more fruitful and profitable.

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