
OPEN-SOURCE SOFTWARE AND KNOWLEDGE MANAGEMENT IN DIGITAL CONTEXT: ISSUES AND IMPLICATIONS

JAGTAR SINGH

Abstract

Open-source software (OSS) is a utility to empower the non-elite individuals and institutions to manage knowledge and develop low cost virtual libraries. It is an attempt to keep the software market away from monopolies and enable the non-elite institutions to build sustainable institutional repositories. Though OSS has made profound impact in the public domain worldwide, yet there is an urgent need to sensitize the stakeholders in India to enable them to learn about the benefits of open-source software and promote the concept and practice behind the movement. Only this way we can ensure diversity, equity, quality and equality, and flexibility in our products and services. Raising awareness among the non-elite about the open-source software is essential for managing knowledge and developing an egalitarian society. Open-source software has the potential to contain the twin perils of digital divide and digital determinism. Institutional repositories and WIKI-Space are the right step in preserving and disseminating our documentary heritage. This paper highlights the recommendations made by the National Knowledge Commission pertaining to the cutting-edge of Open-source software and knowledge management. It also raises a few issues that need immediate attention to empower the info-poor and develop an inclusive society. Implications of open-source software and knowledge management have also been pointed out.

Keywords: Open-Source Software/ Knowledge Management/ Lifelong Learning/ Information Literacy/ LIS Education

1. Paradigm Shift

Information and communication technologies have made profound impact on libraries and information centres. Resource sharing via networking and seamless access to quality information across the globe is a near reality for the elite institutions. But the 'info-poor' across the globe are still at a loss as they cannot afford to pay for the Internet connectivity and the information needed by them for their self-actualization. In fact, this world is full of disparity and discrimination. Open-source movement is an attempt to empower the 'info-poor' with tools, resources, and services that cannot be available

to them otherwise. It is based upon the philosophy of public good against the vested interests of the commercial domain. Rhetorically speaking, we have moved away from nomadic society to knowledge society through agricultural, industrial and information societies. But have we ever tried to carry the poor people along with us in this transition? All of their problems are rooted in their illiteracy and poverty. Open Source movement is a typical manifestation for the win-win situation for public good and the profit motive. Hence, concerted efforts must be made to take this movement to grass root level by spreading its awareness among the masses. Its benefits must be brought to the notice of those potential stakeholders who are not able to afford the luxury of propriety software. Otherwise, Open Source movement will be just like a peacock dancing in a forest without being a source of happiness for the stakeholders. If we look around, we find that there is a paradigm shift from:

- Traditional Libraries to Digital/Virtual libraries
 - Standalone Libraries to Library and Information Networks
 - Hierarchical to Flattened Organizations
 - Printed Publications to Digital Documents
 - Bundling to Unbundling of Documents
 - Enclosure to discloser
 - Ownership to Access
 - Just-in-Case to Just-in-Time Access
 - Linear to Non-Linear Mode of Interaction
 - Intra-active to Interactive Systems
 - Exclusive to Inclusive Society
 - Real to Virtual Communities
 - Mere Consumers to Alert End-users
 - Analog to Digital Documents
 - Atoms to Bits
 - Products to Services
 - Intermediaries to End-Users
 - Teaching to Learning
 - Rigidity to Flexibility
 - In sourcing to Out sourcing
 - Top-down to Bottom-up
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- Whole-part to Whole-within-whole
 - Centralization to Decentralization
 - Hot to Cool Medium
 - Library to Web
 - Content to Context
 - Copyright to Copy Left
 - Order to Chaos, and
 - Open source to WIKI Source

Unfortunately, the by-products and benefits of this shift are not available to the 'have nots' all across the globe. Nevertheless, Open-Source movement is the step in the right direction in the digital context to empower the potential stakeholders by providing them with real-time access to quality products and services. But still it has to go a long way to reach the grass roots. Similarly, it is high time that we learn to use information and communication technologies (ICT) for empowering people with scientific knowledge and leading-edge skills. The focus of knowledge management must be on people unlike ICT that is used for processing information for value addition. Knowledge creation, capturing, retention, networking, sharing and using are essential conditions for developing India into a knowledge economy. National Knowledge Commission has for the first time in its recommendations given due recognition to the role of libraries in contributing to the development of the nation. To develop an inclusive society, it has recommended to include libraries in the concurrent list; create National Library Fund of Rs. 1000 crore to upgrade the existing libraries; a permanent National Commission on Libraries; a well equipped Institute for Advance Training and Research in Library and Information Science; national level survey to assess requirements and reading habits; development of open source software and digital libraries in English and Indian languages. These are welcome recommendations provided appropriate action is taken on these in a timely manner. Professional associations in India must join hands to impress upon the Government of India to implement the recommendations of the Commission during the eleventh Five Year Plan. Without modernizing our libraries the mission of developing India into a knowledge economy cannot be realized.

2. Digital Divide & Determinism

The convergence of information and communication technologies (ICT) has made the world very small. The Internet and the web have given a death blow to the traditional constraints of space and time. Instant access to quality information is now possible, provided the stakeholders are info-literate and in a position to afford the needed information. But the benefits of the ICT and their convergence have so far been available to the elite end-users only in the developing countries. In India, still 260 million people are living below poverty line. Access to knowledge and information for them is a distant

dream till egalitarian policies and sustainable strategies are in place. Same is the case with many such people in the developing countries. The twin perils digital divide and digital determinism need be contained with the help of digital inclusion and social determinism. We must use ICT and the Internet to reach out the rural and urban 'info-poor'. Otherwise, seamless access to quality information for all across frontiers will remain a distant dream. Open Source movement has the potential to make it a near reality and the Open-Source Software is the first step in this context. Cost is a major factor in integrating ICT into libraries and information centres. Open-Source Software can play a pivotal role in breaking the monopoly of the Microsoft, Oracle and similar other companies. If Microsoft Windows Software is replaced with Open-Source Software like Apache, it can save billions of dollars. This money can be used to extend the benefits of the Internet and the Web to the millions of 'info-poor' in the developing countries of the world. If standardization and interoperability issues are taken care of, then the cost of equipping people with the techniques of technology can also be saved to a large extent. In fact, Open-Source Software is a God sent opportunity for the technology destitute stakeholders. Besides breaking the monopoly of the propriety software, Open-Source Software will enable people to generate revenue at institutional level as access to the source code facilitates immense customization.

3. Egalitarian Philosophy

The open-source movement is based upon an egalitarian philosophy to empower the non-elite individuals and institutions with the by-products of the Internet and the Web. People are responding to this philosophy and there is a lot of activity in India to create awareness of the open-source software. Suvarsha Walters and Madhuresh Singal of the National Centre for Science Information, IISc, Bangalore have compiled a comprehensive list of free software for libraries. It is entitled "Free/Open Source Software for Library and Information Management" and it can be accessed via the link www.ncsi.iisc.ernet.in/raja/opendl The workshops held at Bangalore, Kolkata, and Kozhikode is an attempt to sensitize the next generation to the next level of consciousness. The next generation must be made aware of whose writ prevails in the software market and who the gainers are and at what cost. ICT can facilitate software development in local languages, but the Microsoft software has embraced the English language to monopolize the software domain. Identifying with the open source movement is the only way to challenge the monopoly of Microsoft and other propriety software. In fact, there is an immediate need to develop institutional repositories with the help of open-source software packages. Otherwise, the whole process of globalization will turn out to be a one-way traffic biased in favour of the 'big brother' and the elite. It is high time to sensitize the next generation of knowledge workers to unite and take the open-source movement to its logical conclusion. Only this way, we can keep the software market away from monopolies and ensure diversity and equity in the emerging information society in the developing world.

4. Level Playing Field

The next generation must understand that we are providing market to the software giants; hence we can not be on the receiving end always. The Government, NGOs, Civil Society, and the Corporate Sector must join hands to develop a level playing field for one and all. Today is not the time to count people, rather now is the time to count on people by empowering them with ICT, the Internet Connectivity, Open-Source Software and information literacy. International Federation of Library Associations and Institutions (IFLA) and the UNESCO are deeply committed to education and information for all. We must also work as active partners to this commitment. Efforts must be made to carry the non-elite individuals and institutions along with the open-source movement. Universities, associations, local, national and international networks can go a long way to develop, and promote the use of open-source software to build sustainable institutional repositories. We are moving away from whole-part relations to whole-within-whole systems. Therefore, every institutional repository is supposed to be an integral part of the memory of mankind. In this era of fierce competition and globalization, access to education, information and technology are the pre-conditions for staying ahead of change, competition, and time. Access to cutting-edge computers, Internet connectivity, and compatible Open-Source software would certainly help in ensuring a level playing field for the elite and the non-elite.

5. LIS Education & Training

The course components about open-source movement should also be an integral part of the LIS and training programmes in the developing countries. Time and again I am putting the Open-Source movement in the context of developing countries only because these countries have always been used as market to sell junk technology on the terms and conditions of the propriety software giants. There must be centers of excellence in each region to lead and guide the next generation to break the monopoly of the propriety software and to build and network the institutional repositories. The Open Source movement will have its full impact only if reaches the grass root level and facilitates information and knowledge management as well as supports strategic professional learning. Capacity building is essential to produce competent professionals who are capable of managing change to stay ahead of competition. For this, the next generation will have to look beyond degrees and propriety software. Technology will never be stable. Hence to cope with technological obsolescence, continuous professional education and training (CPET) is an effective way out. E-learning and short-term training workshops can also empower the stakeholders on the leading-edge of the OSS and ICT. Leaders in the area of OSS must also develop and distribute modules on various open-source software packages to create awareness and competence among the trainers and the trainees. Subject gateways, portals, and printed manuals can also facilitate OSS awareness. There must be a full fledged paper on knowledge management in the LIS programmes in India. National Knowledge Commission has also made a very good

recommendation to establish a well equipped Institute for Advance Training and Research in Library and Information Science.

5.1 Attitudinal Issues

Most of our problems are basically the result of our passive and pessimistic mind-set. Success of the open-source movement is possible only through change of the majority mind-set. Instead of resisting change and feeling insecure, the old generation of LIS professionals must encourage and motivate the next generation to develop an egalitarian and pro-active mind-set. Experiments with open-source software must be carried out, because collective wisdom is always better than individual intelligence. Open-source Software gives us the right to run, copy, distribute, and improve it as the source code is always available with the end-user. Efforts must be made to develop hybrid libraries which are expert assisted and user-centered. There must be a fair balance between the push and pull technology to contain the twin perils of digital divide and digital determinism. But the development of the Open-Source Software is not possible without the help of info-literate people. Information literacy includes ICT literacy also. The biggest benefit of the OSS is that it easy to troubleshoot it without looking at the vested interests. OSS can provide institutions with capacity to develop their resources and services at a low cost. But for that an organization must be a learning organization and the knowledge workers must believe in TQM, benchmarking and team spirit. There is no place for people with passive and traditional mind-set. One must learn to be, to become, to do, to unlearn and to relearn. That is the only way to survive and thrive in the open society that is always in search of a level playing field and working upon the philosophy of equity, diversity, and flexibility. Only people with open mind can facilitate social inclusion and equity.

5.2 Information Literacy

To implement the philosophy behind information commons, it is essential that the stakeholders are info-literate. They must be aware of the fact that information is a source of instant power and it can make or mar future of anyone depending upon its availability or non-availability. It facilitates decision-making and eliminates uncertainty. The quality of decisions depends upon the quality of information. In other words, information literacy is a tool for lifelong learning and self-actualization. It is the ability to access, process, and use the needed information strategically for obtaining one's mission and vision. UNESCO is celebrating the United Nations Literacy Decade ' (2003-12) as well as promoting the 'Education for All Programme' and the 'Information for All Programme'. But can there be information for all without education for all? Certainly, education is the foundation for developing independent learners and critical thinkers. Information literacy is the ability of people to convert information into

knowledge and knowledge into information. Information is a critical link between the information society and knowledge society. The focus of information society is on the use of ICT for information management, whereas the focus of knowledge society is on empowering the people with information literacy, tacit knowledge, lifetime skills, enduring values and positive attitude. Basically, access management is the first step for success management. Hence, concerted efforts must be made to use information and ICT for enhancing learning, raising information literacy awareness, training the teachers, creating the local content, and ensuring information literacy conducive environment. We must remember that only info-literate people can support the cause of information commons and take the democratization of knowledge and information to the grass root level.

6. Empowering-8 Model

Keeping the need for information literacy in mind, the 'Empowering-8 Model' was developed at the IFLA Sponsored International Workshop on 'Information Skills for Learning' hosted by the National Institute of Library and Information Sciences (NILIS), University of Colombo, Colombo, Sri Lanka from 01-05 November 2004. This model was further discussed at two more IFLA/UNESCO sponsored workshops held at Punjabi University, Patiala in India and at Shah Village Hotel, Kuala Lumpur in Malaysia from 03-07 October 2005 and from 08-12 June 2006 respectively. In the words of Prof. Russell Bowden, the E-8 Model consists of the following eight steps:

1. Identify – subject, audience, key words & plan strategy;
2. Explore – resources required, information available;
3. Select – relevant information; stages of work, appropriate citations;
4. Organize – information earlier selected, between fact, fiction & opinion;
5. Create – information in your own words, revise & edit & create bibliography;
6. Present – share information with appropriate audience; display in appropriate format;
7. Assess – feedback; self-assessment and assessment with teacher;
8. Apply – review feedback and apply to next learning activity.

In fact, information literacy is an essential condition for information management, knowledge management, and lifelong learning. Learning, unlearning and relearning are essential processes for understanding the semantics of our life and work. In other words, fact is sacred cow and comment is free. It is a hard fact that we can not develop India as a knowledge society without empowering every Indian citizen with education, information, knowledge and information literacy. All Indians are required to be independent learners and critical thinkers to stay ahead of change, competition and time.

7. Conclusion

Open-Source Software alone can not ensure democratization of access to knowledge and information. We must take holistic view of the problem. The concomitant skills to use and troubleshoot the Open-Source Software must also be developed among the next generation. After all developing Open-Source Software is not an end in itself. Promoting its use to build sustainable institutional repositories and the networking the same to provide seamless access across frontiers to one and all should be our vision to develop India as a knowledge society. Only this way the fragrance of freedom and benefits of low cost software solutions will be available to masses. I am sure that Caliber 2007 would certainly address these issues to develop a fully conscious next generation of stakeholders and an inclusive society. Our whole life is a process of becoming through learning. In other words, it is a process of being and becoming. The main question in one's life is 'to be or not to be'. This question is relevant for us today in context of OSS. It is to be with Open-Source Software or to be with propriety software. Certainly, the people who believe in public good can not be with the propriety software. But supporting the cause of OSS without taking it to its logical conclusion will not yield the desired results. School libraries are the weakest link in majority of the developing countries. Same is the case with public libraries in these countries. Therefore, there is a strong and an immediate need to create awareness of OSS among school and public library communities. If awareness of OSS is created at school level, it would be very easy to empower the 'info-poor' and break monopoly of the propriety software.

Simply speaking, OSS is the harbinger of freedom, democratization, quality, equality, diversity, equity, and flexibility; whereas propriety software is relic as well as a tool in the hands of vested interests that would never look beyond profit motive. The commoditization and commercialization of information and software must be dealt with an iron hand of Open-Source Software and knowledge management to empower the potential stakeholders to become assets for human progress. Seamless affordable access to information, knowledge, technology and learning must be facilitated by creating awareness of OSS and knowledge management and promoting their use at the grass root level. There must be a fair balance between the public good and profit motive. After all, the commercial domain is getting the market for its propriety software and structured information at different levels. It can not be allowed to generate disproportionate wealth at the cost of public good. Concerted efforts must be made to convert challenges into opportunities. The envisioned knowledge society in India can never be democratic in essence if the propriety software and commercially controlled knowledge are allowed to determine the fate of the nation. The must learn to use information and communication technology (ICT) to convert information into knowledge and vice versa. Though ICT are not value neutral, yet these can not be left in the hands of those who control them. By leaving the control of information, ICT, knowledge and software with the elite and the commercial domain, we will be denying opportunities to the 'info-poor' to improve the quality of their life and work. This politics of profit by the commercial domain must be stopped with the help spreading the concept and practice of Open-Source Software and knowledge management across the globe. The Government of India must be impressed

upon to take the recommendations of the National Knowledge Commission to their logical conclusion by implementing them in a phased manner.

Further Readings

Open-Source Software

1. Antelman, K. Do Open Access Articles have a Greater research Impact? *College and Research Libraries News*, 65 (3):372-82, 2004.
 2. Arunachalam, Subbiah Open Access- Current Developments in India. In proceedings
 3. Berlin 4 open Access: From Promise to Practice, Max-Planck-Institute for Gravitational Physics, Albert Einstein Institute, Potsdam-Golm, 2006.
 4. Bailey, C.W. Jr. *Open Access Bibliography: Liberating Scholarly Literature with E-prints and Open Access Journals*. Washington, DC: Association of Research Libraries, 2005.
 5. Budapest Open Access Initiative, August 14, 2002. Available at: <http://www.soros.org/openaccess/read.shtml>
 6. Directory of Open access Journal, 2005, Available at: <http://www.doaj.org>
 7. Goodman, D. The Criteria for Open Access. *Serial Review*, 30(4):258-70. Available at: http://www.eprints.rclis.org/archive/000003542/02/SR30_4_Goodman.pdf (Accessed on 17 March 2006).
 8. Harnad, Steven. Fast-Forward on the green road to open access: the case against mixing up green and gold. *Ariadne*, 42, 2005. Available at: <http://www.ariadne.ac.uk/issue42/harnad/intro.html>
 9. Joint, Nicholas. Institutional repositories, self-archiving and the role of the library. *Library Review*, 55(2):81-4:2006. Available at: <http://www.emeraldinsight.com/0024-2535.htm>
 10. Kalam, A.P.J. Abdul. Asian Cooperation for World Knowledge Platform., *New Asia Monitor*, 3(2), 2006. Available at: <http://www.presidentofindia.nic.in/scripts/flatest1.jsp?id=45>
 11. Morgan, Eric Lease. *Open Source software for libraries in thirty minutes*. [S.l.]: University Libraries of Notre Dame, 2006.
 12. Open Archives Initiative. Registered service providers. Available at: <http://www.openarchives.org/service/listproviders.html>
 13. Sahoo, D.K. and Parmar, R.C. *Open access in India*. In *Open access: Key strategic, technical and economic aspect*. Ed by Neil Jacobs. Oxford: Chandos Publishing, 2006.
-

14. Suber, P. Open access overview: focusing on open access to peer-reviewed research articles and their preprints, 2005. Available at: <http://www.earlham.edu/~peters/fos/overview.htm>
15. Suber, P. Creating an intellectual commons through open access, 2004. Available at: <http://www.dlc.dlib.indiana.edu/archives/00001246/>
16. Suber, P. Timeline of open access movement. Available at: <http://www.earlham.edu/~peters/fos/timeline.htm>

Knowledge Management

17. Al - Hawamdeh, Suliman. Knowledge Management: Cultivating Knowledge Professionals. Oxford: Chandos Publishing, 2003.
 18. ASLA and ALIA. Learning for the Future: Developing Information Services in Schools. 2nd ed. Carlton South Vic: Curriculum Corporation, 2001.
 19. White, Don. Knowledge Mapping and Management. London: IRM Press, 2002.
 20. Gowarikar, Vasanth. Higher Education in India in the 21st Century. In Higher Education: Challenges and Visions, edited by Prashant K. Sinha. Pune: University of Pune, 1999.
 21. Jagtar Singh. Information Democracy and South Asia: Promises and Perils of the Web. Ludhiana: Medallion, 2003.
 22. Karisiddappa, C. R. Library and Information Science Curriculum for the Developing Countries. WLIC: 70th IFLA General Conference and Council, 22-27 August 2004, Buenos Aires, Argentina. <<http://www.ifla.org/IV/ifla70/prog04.htm>>
 23. Lehaney, Brian and Others. Beyond Knowledge Management. London: Idea Group Publishing, 2004.
 24. Malhotra, Yogesh. Knowledge Management and Business Model Innovation. London: Idea Group Publishing, 2001.
 25. Malhotra, Yogesh. Knowledge Management and Virtual Organizations. London: Idea Group Publishing, 2000.
 26. Schwarts, David G. Internet-Based Organizational Memory and Knowledge Management. London: Idea Group Publishing, 2000.
 27. Senge Peter M. The Fifth Discipline: The Art and Practice of Learning Organizations. London: Doubleday, 1992.
 28. St. Clair, Guy. Beyond Degrees: Professional Learning for Knowledge Services. Munchen: K. G. Sur, 2003.
 29. UGC Grants Commission. UGC Model Curriculum: Library and Information Science. New Delhi: UGC, 2001.
-

30. UNESCO. Curriculum for Information Society: Educating and Training Information Professionals in the Asia-Pacific Region, by Nick Moore and Others. UNESCO: Regional Office for Asia and Pacific, 1998
31. Coakes, Elayne. Knowledge Management: Current Issues and Challenges. London: IRM Press, 2003.

BIOGRAPHY OF AUTHOR



Dr. Jagtar Singh is presently working as Professor in the Department of Library and Information Science, Punjabi University, Patiala (India). During 1992-93, he was awarded the prestigious Commonwealth Academic Staff Fellowship by the Commonwealth Scholarship Commission. He has received many awards as recognition for his professional contributions. He has published about 100 articles and research papers in national and international professional journals, conferences and seminars. He is life member of various professional associations, namely, PLA, ILA, SIS, IASLIC, and IATLIS.

Email : jagtar.kindu@gmail.com
