

Original Research Article**IMPROVING METHOD OF EVALUATING SEMANTIC FILTERING FOR
HUMAN COMPUTER INTERACTION IN AN ADAPTIVE COLLABORATIVE
LEARNING ENVIRONMENT****ABSTRACT**

Human Computer Interaction Semantic filtering techniques are used in learning environment to track problems in collaborative systems. However, as noted in Adigun et al (2012), when sharing and dynamism are promoted, a problem of redundancy and integrity appeared not to have been well addressed. An improved ASF-based method of evaluating semantic filtering for social network systems in collaborative learning environment is developed, which assisted participants to achieve greater levels of performance with information sharing from other collaborators, as well as in reusing ideas across the period of collaboration

Keyword: HCI, Semantic filtering, Adaptive collaborative system, Participant, Information sharing and reuse.

1. INTRODUCTION

Human Computer Interaction Semantic filtering (HCISF) techniques are used in learning environment to track problems in collaborative systems. Human Computer Interaction (HCI) is the study, planning and design of the interaction between users and computers (Sears and Jacko, 2007). Semantic filtering is anything that has to do with the meaning process of asking around when looking for information on the Internet (Goldberg et al., 1992). As such, HCI filtering attempts to facilitate interaction between humans and computers with a view to improve the usability of collect content relevant to concurrent real-time events, for instance, from major 'social networks'—collection of a huge amount of growing implicit knowledge about people and domains of interest (Gregorio and Antonio, 2012)—features in end-users' applications. Recently, the Web is all about social utilities like Facebook, Twitter, YouTube etc. that have reduced the use of portals and search engine. While users took control of the Web in order to be more accurate, they have shifted to a click and fans-based engagement system so as to be followed, to be shared, and to be mentioned. Whilst this set of applications allow freedom to navigate and be followed, when sharing and dynamism are promoted, a problem of redundancy and integrity appeared not to have been well addressed (Adigun et al., 2012). Issues of semantic filtering occur when users experienced a lack of integrity with the information provided for use on social networks. This leads us to investigating the process of improving HCISF particularly where adaptive collaboration and information sharing can be effected dynamically with the aim of reducing data redundancy and maintaining HCI integrity across social utilities' system platforms.

40 This paper solves the problem by making use of database expansion and Active Semantic
41 filtering (ASF) technique.

42

43 2. METHODOLOGY

44 We formulated our *active semantic filtering* (ASF) model enabling benchmarking, system
45 sharing and mode reusing. ASF model around four basic approaches: Semantic filtering
46 architecture, Semantic filtering coding, Semantic filtering application, and Semantic filtering
47 testing (Breese et al., 1998). Typically, an ASF-based system is conceptualized on Three Rs
48 workflow model, as seen in Fig. 1, specifically: R1: Role—assigned action or activities (Physical
49 devices); R2: Route—path for processing; and R3: Rule—logical devices to measure the
50 effectiveness and functionality of semantic filtering. This system aims at enhancing the usability
51 and integrity of data in the interaction. Workflow model that integrates Fox and Grüniger
52 (1998) methods was used as a data modeling techniques to define and analyze data requirements
53 needed to support the adaptive collaboration particularly in dynamic environments enabling
54 problem-solving platform for information sharing and reuse.

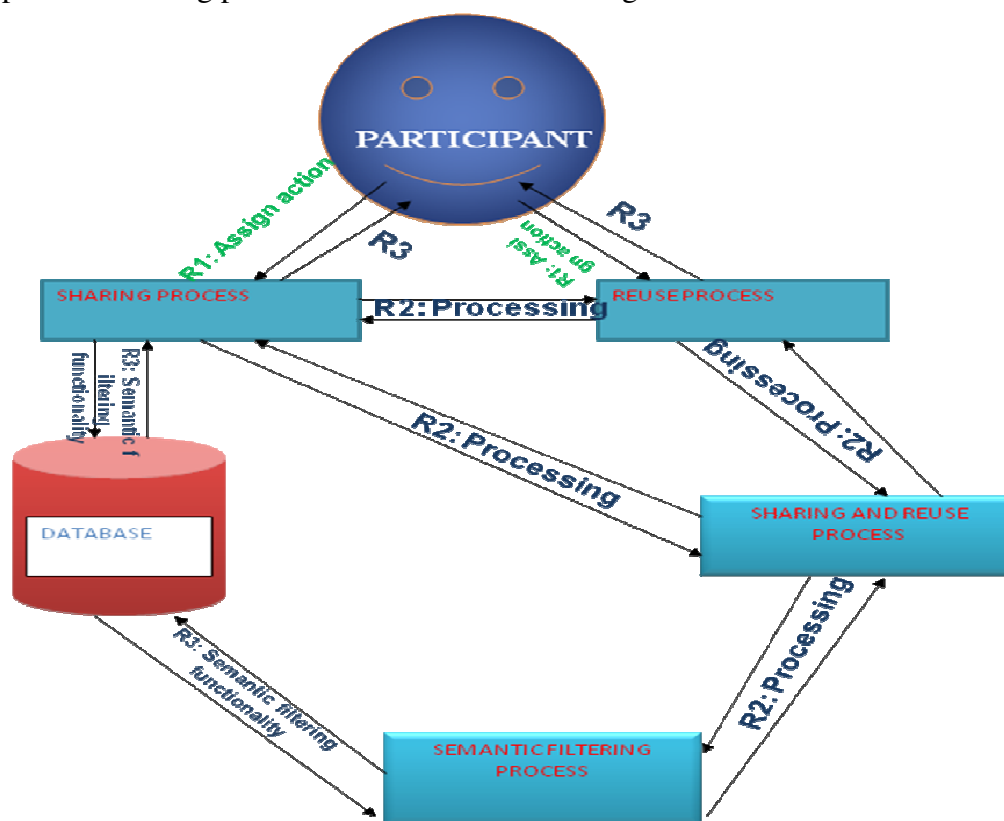


Fig. 1: ASF workflow model

55

56

57 Fig. 2 shows the design process (flowchart) of the ASF model used.

58

59 The registration and identity code of participants

```

60      <EntityType Name="Participant">
61          <Key>
62              < ParticipantRef Name="GSM" />    //password because it is the only   unique string
63                                              in the database among the participants
64          </Key>
65          <Participant Type="String" Name="GSM" Nullable="false" />    //because a name
66                                  can belong to two or more participants. Therefore, GSM is
67                                  serving as participant's name
68          <NavigationParticipant Name="password"
69                                  Relationship="ParticipantsName.PassworddBy"
70                                  FromRole="Participant" ToRole="password" />
71          <NavigationParticipant Name="password"
72                                  Relationship="      ParticipantsName.GSMBy"      FromRole="Participant"
73                                  ToRole="password" />
74          // i.e. moving round the platform as a participant by the use of GSM as unique key
75      </EntityType>

```

76
 77 To test the ASF-model, a dynamic MySQL database was developed containing ≥ 100
 78 participants' list and ≥ 20 issues raised by the administrator. Questions were made available and
 79 accessed on the system by users through interrupt caller on Local Area Network (LAN). The
 80 system enabled participants to revisit the interface if questions had not been completed, and/or to
 81 post their responses to the issues raised, shared and/or reuse ideas posted by others. Three
 82 visitations were possible by a participant while at the end of the third visit, questions were
 83 terminated whether it was attempted or not to determine the benchmark level.

85 3. RESULTS

86 The total number of participants per month per issue raised, number of visitations per month,
 87 total number of participants that shared ideas, total participants that reused ideas and the
 88 benchmark level were determined through word-matching as well as semantic filtering analysis
 89 of ideas shared and reused in the database. The total number of participants that were stored in
 90 the database was 104.
 91 Participants that visited in first, second and third visitations were 101, 82 and 8, respectively.
 92 With word-marching and semantic filtering analysis, the Participants that get to benchmark level,
 93 shared ideas and reused ideas were 15, 92 and 45, respectively, with corresponding percentage
 94 number of 1.78%, 47.47% and 40.50%, as depicted in Fig. 3. When compared with the previous

database system that encouraged the use of redundancy with no integrity, the ASF-model assisted participants to achieve greater levels of performance with information sharing from other collaborators leading to an improvement in reusing ideas. The level of redundancy in ideas posed by the participant reduced, which was reflected by the 6.97% difference between the shared and reused ideas in the database. The study demonstrates that the use of ASF-based system, for information sharing and reuse, really discourages the redundancy in the database management system but appears to solve the problem of data integrity in Human Computer Interaction.

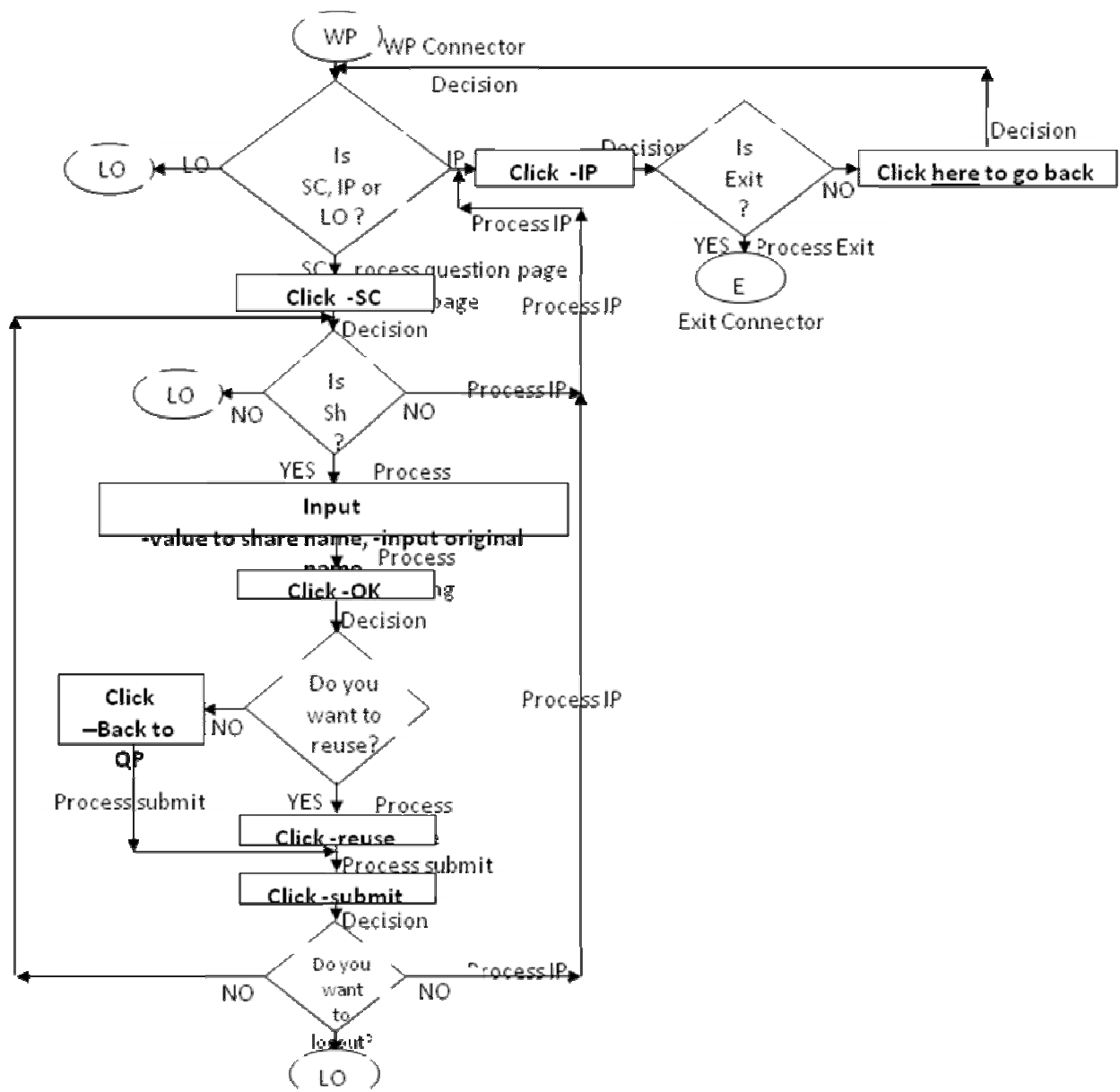


Fig. 2: ASF Flowchart design

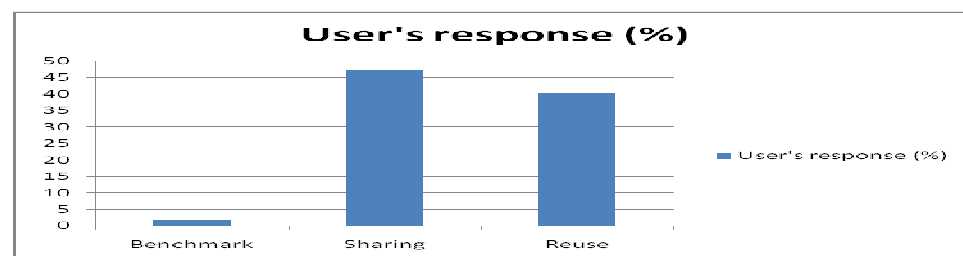


Fig. 3: Semantic filtering analysis database system

4. CONCLUSION

This study has provided an improved ASF-based method of evaluating semantic filtering for social network systems in collaborative learning environment. The model assisted participants to achieve greater levels of performance with information sharing from other collaborators leading to an improvement in reusing ideas. The study demonstrated that the use of active semantic filtering model for information sharing and reuse really discourages the redundancy in the database management system but solves the problem of data integrity in Human Computer Interaction.

REFERENCES

1. Adigun, A.A., Osofisan, A.O., Robert, A.B.C., Kolawole, M.O. (2012): Adaptive collaboration in a dynamic environment for information sharing. *Journal of Emerging Trends in Computing and Information Sciences*, 3:7, 1089-1092
2. Sears, A. and Jacko, J.A. (Eds) (2007): *Human-Computer Interaction Handbook* (2nd Edition). CRC Press.
3. Breese, J.S., Heckerman, D., Kadie, C. (1998): Empirical Analysis of Predictive Algorithms for Collaborative Filtering. *Technical Report MSR-TR-98-12*, 43–52.
4. Fox, M.S and Grüninger, M. (1998): Enterprise Modeling *American Association for Artificial Intelligence Magazine*, 109-121
5. Goldberg, D., Nichols, D., Oki, B.M., Terry, D. (1992): Using collaborative filtering to weave an information tapestry. *Communications of the ACM*, 35:12, 61-70