Springer Link

Insurance for Improving User Satisfaction Level

Business & Information Systems Engineering

pp 1–12

- Hossein Morshedlou (1) Email author (morshedlou@aut.ac.ir)
- Mohammad Reza Meybodi (1)

1. Department of Computer Engineering, AmirKabir University of Technology, Tehran, Iran

Research Paper

First Online:
26 July 2017

Received:
01 June 2015
Accepted:
30 September 2016

- 2 Downloads

Abstract

Service-level agreement (SLA) violations may lead to losses and user dissatisfaction. Despite the fact that a service guarantee can increase the satisfaction level of users, indemnities may not be commensurate with the importance of a service to a user. While predefined penalties may be insufficient to compensate for the losses of one user, another user may not suffer loss from the SLA violation. With an insurance plan, an insurer can reach an agreement with users on the premium and loss coverage volume; insurance can therefore be considered a solution for providing indemnity which is appropriate to the importance of service. An insurer cannot protect users against these losses, which are caused by a single root event, in the same way as it protects them against the losses caused by independent events. In this paper, a novel approach is proposed for providing insurance coverage for such root events by limiting insurance provisions to the users with the highest priority. A criterion is presented for priority assignment to users, and an algorithm is then proposed for providing insurance according to this priority. A game-theoretic analysis is also provided to assess acceptability of the outcome of the proposed algorithm to rational users and insurers. The results of numerical experiments demonstrate the usefulness of the proposed approach for improving the utility of the service.

Keywords

Risk aversion Loss User satisfaction Learning automata

Accepted after three revisions by Prof. Dr. Schoder.

Electronic supplementary material

The online version of this article (doi:10.1007/s12599-017-0492-2 (http://dx.doi.org/10.1007/s12599-017-0492-2)) contains supplementary material, which is available to authorized users.

Supplementary material

12599_2017_492_MOESM1_ESM.pdf (172 kb)
Supplementary material 1 (PDF 171 kb)

References

Aceto G, Botta A, de Donato W, Pescapè A (2013) Cloud monitoring: a survey. Comput Netw 57:2093–2115. doi:10.1016/j.comnet.2013.04.001 (http://dx.doi.org/10.1016/j.comnet.2013.04.001)
CrossRef (http://dx.doi.org/10.1016/j.comnet.2013.04.001)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Cloud%20monitoring%3A%20a%20survey&author=G.%20Aceto&author=A.%20Botta&author=W.%20Donato&author=A.%20Pescap%C3%A8&journal=Comput%20Netw&volume=57&pages=2093-2115&publication_year=2013&doi=10.1016%2Fj.comnet.2013.04.001)

Allon G, Federgruen A (2009) Competition in service industries with segmented markets. Manag Sci 55:619–634. doi:10.2139/ssrn.907322 (http://dx.doi.org/10.2139/ssrn.907322)
CrossRef (http://dx.doi.org/10.1287/mnsc.1080.0946)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Competition%20in%20service%20industries%20with%20segmented%20markets&author=G.%20Allon&author=A.%20Federgruen&journal=Manag%20Sci&volume=55&pages=619-634&publication_year=2009&doi=10.2139%2Fssrn.907322)

Atif Y (2002) Building trust in e-commerce. IEEE Internet Comput 6:18–24. doi:10.1109/4236.978365 (http://dx.doi.org/10.1109/4236.978365)
CrossRef (http://dx.doi.org/10.1109/4236.978365)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Building%20trust%20in%20e-commerce&author=Y.%20Atif&journal=IEEE%20Internet%20Comput&volume=6&pages=18-24&publication_year=2002&doi=10.1109%2F4236.978365)

Barto, Anandan P (1985) Pattern-recognizing stochastic learning automata. IEEE Trans Syst Man Cybern SMC 15:360–375. doi:10.1109/tsmc.1985.6313371

(http://dx.doi.org/10.1109/tsmc.1985.6313371)
CrossRef (http://dx.doi.org/10.1109/TSMC.1985.6313371)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Pattern-recognizing%20stochastic%20learning%20automata&author=.%20Barto&author=P.%20Anandan&journal=IEEE%20Trans%20Syst%20Man%20Cybern%20SMC&volume=15&pages=360-375&publication_year=1985&doi=10.1109%2Ftsmc.1985.6313371)

Baset S (2012) Cloud SLAs: present and future. ACM SIGOPS Oper Syst Rev 46:57. doi:10.1145/2331576.2331586 (http://dx.doi.org/10.1145/2331576.2331586)
CrossRef (http://dx.doi.org/10.1145/2331576.2331586)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Cloud%20SLAs%3A%20present%20and%20future&author=S.%20Baset&journal=ACM%20SIGOPS%20Oper%20Syst%20Rev&volume=46&pages=57&publication_year=2012&doi=10.1145%2F2331576.2331586)

Benartzi S, Thaler R (1995) Myopic loss aversion and the equity premium puzzle. Q J Econ 110:73–92. doi:10.2307/2118511 (http://dx.doi.org/10.2307/2118511)
CrossRef (http://dx.doi.org/10.2307/2118511)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Myopic%20loss%20aversion%20and%20the%20equity%20premium%20puzzle&author=S.%20Benartzi&author=R.%20Thaler&journal=Q%20J%20Econ&volume=110&pages=73-92&publication_year=1995&doi=10.2307%2F2118511)

Bhattacharya A, Choudhury S (2015) Service insurance: a new approach in cloud brokerage. In: Chaki R, Saeed K, Choudhury S, Chaki N (eds) Applied computation and security systems. Advances in intelligent systems and computing, vol 305. Springer, New Delhi
Google Scholar (http://scholar.google.com/scholar_lookup?title=Service%20insurance%3A%20a%20new%20approach%20in%20cloud%20brokerage&author=A.%20Bhattacharya&author=S.%20Choudhury&publication_year=2015)

Bowen J, Chen S (2001) The relationship between customer loyalty and customer satisfaction. Int J Contemp Hospitality Manag 13:213–217. doi:10.1108/09596110110395893 (http://dx.doi.org/10.1108/09596110110395893)
CrossRef (http://dx.doi.org/10.1108/09596110110395893)
Google Scholar (http://scholar.google.com/scholar_lookup?title=The%20relationship%20between%20customer%20loyalty%20and%20customer%20satisfaction&author=J.%20Bowen&author=S.%20Chen&journal=Int%20J%20Contemp%20Hospitality%20Manag&volume=13&pages=213-217&publication_year=2001&doi=10.1108%2F09596110110395893)

Catteddu D (2010) Cloud computing: benefits, risks and recommendations for information security. Web Appl Secur. Springer, Heidelberg
Google Scholar (https://scholar.google.com/scholar?q=Catteddu%20D%20%282010%29%20Cloud%20computing%3A%20benefits%2C%20risks%20and%20recommendations%20for%20information%20security.%20Web%20Appl%20Secur.%20Springer%2C%20Heidelberg)

Dong W, Shah H, Wong F (1996) A rational approach to pricing of catastrophe insurance. J Risk Uncertain 12:201–218. doi:10.1007/bf00055794
(http://dx.doi.org/10.1007/bf00055794)
CrossRef (http://dx.doi.org/10.1007/BF00055794)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20rational%20approach%20to%20pricing%20of%20catastrophe%20insurance

&author=W.%20Dong&author=H.%20Shah&author=F.%20Wong&journal=J%20Risk%20Uncertain&volume=12&pages=201-218&publication_year=1996&doi=10.1007%2Fbf00055794)

Einhorn HJ, Hogarth RM (1988) Decision making under ambiguity: a note. In: Munier BR (ed) Risk, decision and rationality. Theory and decision library (Series B: Mathematical and Statistical Methods), vol 9. Springer, Dordrecht
Google Scholar (http://scholar.google.com/scholar_lookup?title=Decision%20making%20under%20ambiguity%3A%20a%20note&author=HJ.%20Einhorn&author=RM.%20Hogarth&publication_year=1988)

Emeakaroha V, Netto M, Calheiros R et al (2012) Towards autonomic detection of SLA violations in cloud infrastructures. Future Gener Comput Syst 28:1017–1029. doi:10.1016/j.future.2011.08.018 (http://dx.doi.org/10.1016/j.future.2011.08.018)
CrossRef (http://dx.doi.org/10.1016/j.future.2011.08.018)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Towards%20autonomic%20detection%20of%20SLA%20violations%20in%20cloud%20infrastructures&author=V.%20Emeakaroha&author=M.%20Netto&author=R.%20Calheiros&journal=Future%20Gener%20Comput%20Syst&volume=28&pages=1017-1029&publication_year=2012&doi=10.1016%2Fj.future.2011.08.018)

Garg S, Toosi A, Gopalaiyengar S, Buyya R (2014) SLA-based virtual machine management for heterogeneous workloads in a cloud datacenter. J Netw Comput Appl 45:108–120. doi:10.1016/j.jnca.2014.07.030 (http://dx.doi.org/10.1016/j.jnca.2014.07.030)
CrossRef (http://dx.doi.org/10.1016/j.jnca.2014.07.030)
Google Scholar (http://scholar.google.com/scholar_lookup?title=SLA-based%20virtual%20machine%20management%20for%20heterogeneous%20workloads%20in%20a%20cloud%20datacenter&author=S.%20Garg&author=A.%20Toosi&author=S.%20Gopalaiyengar&author=R.%20Buyya&journal=J%20Netw%20Comput%20Appl&volume=45&pages=108-120&publication_year=2014&doi=10.1016%2Fj.jnca.2014.07.030)

Grönroos C (2007) Service management and marketing: customer management in service competition. Wiley, Hoboken
Google Scholar (http://scholar.google.com/scholar_lookup?title=Service%20management%20and%20marketing%3A%20customer%20management%20in%20service%20competition&author=C.%20Gr%C3%B6nroos&publication_year=2007)

Hani A, Paputungan I, Hassan M (2015) Renegotiation in service level agreement management for a cloud-based system. CSUR 47:1–21. doi:10.1145/2716319 (http://dx.doi.org/10.1145/2716319)
CrossRef (http://dx.doi.org/10.1145/2716319)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Renegotiation%20in%20service%20level%20agreement%20management%20for%20a%20cloud-based%20system&author=A.%20Hani&author=I.%20Paputungan&author=M.%20Hassan&journal=CSUR&volume=47&pages=1-21&publication_year=2015&doi=10.1145%2F2716319)

Hogarth R, Kunreuther H (1992) Pricing insurance and warranties: ambiguity and correlated risks. Geneva Pap Risk Insur Theory 17:35–60. doi:10.1007/bf00941956 (http://dx.doi.org/10.1007/bf00941956)

CrossRef (http://dx.doi.org/10.1007/BF00941956)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Pricing%20insurance%20and%20warranties%3A%20ambiguity%20and%20correlated%20risks&author=R.%20Hogarth&author=H.%20Kunreuther&journal=Geneva%20Pap%20Risk%20Insur%20Theory&volume=17&pages=35-60&publication_year=1992&doi=10.1007%2Fbf00941956)

Javadi B, Abawajy J, Buyya R (2012) Failure-aware resource provisioning for hybrid cloud infrastructure. J Parallel Distrib Comput 72:1318–1331. doi:10.1016/j.jpdc.2012.06.012 (http://dx.doi.org/10.1016/j.jpdc.2012.06.012)
CrossRef (http://dx.doi.org/10.1016/j.jpdc.2012.06.012)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Failure-aware%20resource%20provisioning%20for%20hybrid%20cloud%20infrastructure&author=B.%20Javadi&author=J.%20Abawajy&author=R.%20Buyya&journal=J%20Parallel%20Distrib%20Comput&volume=72&pages=1318-1331&publication_year=2012&doi=10.1016%2Fj.jpdc.2012.06.012)

Linlin W, Buyya R (2012) Service level agreement (SLA) in utility computing systems. In: Performance and dependability in service computing: concepts, techniques and research directions. IGI Global, USA
Google Scholar (https://scholar.google.com/scholar?q=Linlin%20W%2C%20Buyya%20R%20%282012%29%20Service%20level%20agreement%20%28SLA%29%20in%20utility%20computing%20systems.%20In%3A%20Performance%20and%20dependability%20in%20service%20computing%3A%20concepts%2C%20techniques%20and%20research%20directions.%20IGI%20Global%2C%20USA)

Luo M, Zhang L, Lei F (2010) An insurance model for guaranteeing service assurance, integrity and QOS in cloud computing. In: IEEE international conference on web services (ICWS). IEEE, Florida, USA, pp 584–591
Google Scholar (http://scholar.google.com/scholar_lookup?title=An%20insurance%20model%20for%20guaranteeing%20service%20assurance%2C%20integrity%20and%20QOS%20in%20cloud%20computing&author=M.%20Luo&author=L.%20Zhang&author=F.%20Lei&pages=584-591&publication_year=2010)

McDougall G, Levesque T (2000) Customer satisfaction with services: putting perceived value into the equation. J Serv Mark 14:392–410. doi:10.1108/08876040010340937 (http://dx.doi.org/10.1108/08876040010340937)
CrossRef (http://dx.doi.org/10.1108/08876040010340937)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Customer%20satisfaction%20with%20services%3A%20putting%20perceived%20value%20into%20the%20equation&author=G.%20McDougall&author=T.%20Levesque&journal=J%20Serv%20Mark&volume=14&pages=392-410&publication_year=2000&doi=10.1108%2F08876040010340937)

Naldi M (2014) Balancing leasing and insurance costs to achieve total risk coverage in cloud storage multi-homing. In: Altmann J, Vanmechelen K, Rana O (eds) Economics of grids, clouds, systems, and services. GECON 2014. Lecture notes in computer science, vol 8914. Springer, Cham
Google Scholar (http://scholar.google.com/scholar_lookup?title=Balancing%20leasing%20and%20insurance%20costs%20to%20achieve%20total%20risk%20coverage%20in%20cloud%20storage%20multi-homing&author=M.%20Naldi&publication_year=2014)

Narendra K, Thathachar M (2012) Learning automata: an introduction. Courier Corporation, USA
Google Scholar (http://scholar.google.com/scholar_lookup?title=Learning%20automata%3A%20an%20introduction&author=K.%20Narendra&author=M.%20Thathachar&publication_year=2012)

Nisan N, Schapira M, Valiant G, Zohar A (2011) Best-response mechanisms. In: The second symposium on innovations in computer science (ICS), Beijing, China, pp 155–165
Google Scholar (https://scholar.google.com/scholar?q=Nisan%20N%2C%20Schapira%20M%2C%20Valiant%20G%2C%20Zohar%20A%20%282011%29%20Best-response%20mechanisms.%20In%3A%20The%20second%20symposium%20on%20innovations%20in%20computer%20science%20%28ICS%29%2C%20Beijing%2C%20China%2C%20pp%20155%E2%80%93165)

Oommen B, Hashem M (2010) Modeling a student's behavior in a tutorial-like system using learning automata. IEEE Trans Syst Man Cybern B 40:481–492. doi:10.1109/tsmcb.2009.2027220 (http://dx.doi.org/10.1109/tsmcb.2009.2027220)
CrossRef (http://dx.doi.org/10.1109/TSMCB.2009.2027220)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Modeling%20a%20student%E2%80%99s%20behavior%20in%20a%20tutorial-like%20system%20using%20learning%20automata&author=B.%20Oommen&author=M.%20Hashem&journal=IEEE%20Trans%20Syst%20Man%20Cybern%20B&volume=40&pages=481-492&publication_year=2010&doi=10.1109%2Ftsmcb.2009.2027220)

Serrano D, Bouchenak S, Kouki Y et al (2013) Towards QOS-oriented SLA guarantees for online cloud services. In: 13th IEEE/ACM international symposium on cluster, cloud and grid computing (CCGrid). IEEE, Delft, Netherlands, pp 50–57
Google Scholar (http://scholar.google.com/scholar_lookup?title=Towards%20QOS-oriented%20SLA%20guarantees%20for%20online%20cloud%20services&author=D.%20Serrano&author=S.%20Bouchenak&author=Y.%20Kouki&pages=50-57&publication_year=2013)

Shao J, Wei H, Wang Q, Mei H (2010) A runtime model based monitoring approach for cloud. In: IEEE 3rd international conference on cloud computing. IEEE, Florida, USA, pp 313–320
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20runtime%20model%20based%20monitoring%20approach%20for%20cloud&author=J.%20Shao&author=H.%20Wei&author=Q.%20Wang&author=H.%20Mei&pages=313-320&publication_year=2010)

Simon H (1982) Models of bounded rationality. MIT Press, Cambridge
Google Scholar (http://scholar.google.com/scholar_lookup?title=Models%20of%20bounded%20rationality&author=H.%20Simon&publication_year=1982)

Siyal M, Barkat B (2002) A novel trust service provider for internet based commerce applications. Internet Res 12:55–65. doi:10.1108/10662240210415826 (http://dx.doi.org/10.1108/10662240210415826)
CrossRef (http://dx.doi.org/10.1108/10662240210415826)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20novel%20trust%20service%20provider%20for%20internet%20based%20commerce%20applications&author=M.%20Siyal&author=B.%20Barkat&journal=Internet%

20Res&volume=12&pages=55-65&publication_year=2002&doi=10.1108%2F10662240210415826)

Sureshchandar G, Rajendran C, Anantharaman R (2002) The relationship between service quality and customer satisfaction—a factor specific approach. J Serv Mark 16:363–379. doi:10.1108/08876040210433248 (http://dx.doi.org/10.1108/08876040210433248)
CrossRef (http://dx.doi.org/10.1108/08876040210433248)
Google Scholar (http://scholar.google.com/scholar_lookup?title=The%20relationship%20between%20service%20quality%20and%20customer%20satisfaction%E2%80%94a%20factor%20specific%20approach&author=G.%20Sureshchandar&author=C.%20Rajendran&author=R.%20Anantharaman&journal=J%20Serv%20Mark&volume=16&pages=363-379&publication_year=2002&doi=10.1108%2F08876040210433248)

Wu L, Kumar Garg S, Buyya R (2012) SLA-based admission control for a software-as-a-service provider in cloud computing environments. J Comput Syst Sci 78:1280–1299. doi:10.1016/j.jcss.2011.12.014 (http://dx.doi.org/10.1016/j.jcss.2011.12.014)
CrossRef (http://dx.doi.org/10.1016/j.jcss.2011.12.014)
Google Scholar (http://scholar.google.com/scholar_lookup?title=SLA-based%20admission%20control%20for%20a%20software-as-a-service%20provider%20in%20cloud%20computing%20environments&author=L.%20Wu&author=S.%20Kumar%20Garg&author=R.%20Buyya&journal=J%20Comput%20Syst%20Sci&volume=78&pages=1280-1299&publication_year=2012&doi=10.1016%2Fj.jcss.2011.12.014)

Xiong L, Liu L (2002) Building trust in decentralized peer-to-peer electronic communities. In: Fifth international conference on electronic commerce research (ICECR-5), Montreal, Canada
Google Scholar (https://scholar.google.com/scholar?q=Xiong%20L%2C%20Liu%20L%20%282002%29%20Building%20trust%20in%20decentralized%20peer-to-peer%20electronic%20communities.%20In%3A%20Fifth%20international%20conference%20on%20electronic%20commerce%20research%20%28ICECR-5%29%2C%20Montreal%2C%20Canada)

Zweifel P, Eisen R (2012) Insurance economics. Springer, Berlin
CrossRef (http://dx.doi.org/10.1007/978-3-642-20548-4)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Insurance%20economics&author=P.%20Zweifel&author=R.%20Eisen&publication_year=2012)

Copyright information

© Springer Fachmedien Wiesbaden GmbH 2017

About this article

Cite this article as:
Morshedlou, H. & Meybodi, M.R. Bus Inf Syst Eng (2017). https://doi.org/10.1007/s12599-017-0492-2

- DOI (Digital Object Identifier) https://doi.org/10.1007/s12599-017-0492-2
- Publisher Name Springer Fachmedien Wiesbaden
- Print ISSN 2363-7005
- Online ISSN 1867-0202

- About this journal
- Reprints and Permissions

Personalised recommendations

1. Fuzzy-TOPSIS based Cluster Head selection in mobile wireless sensor networks
   Khan, Bilal Muhammad... Young, Rupert
   Journal of Electrical Systems and Information Technology (2017)

2. Adaptive Petri net based on irregular cellular learning automata with an application to vertex coloring problem
   Vahidipour, S. Mehdi... Esnaashari, Mehdi
   Applied Intelligence (2016)

3. Cuckoo search with composite flight operator for numerical optimization problems and its application in tunnelling
   Abedi Firouzjaee, Hossein... Meybodi, Mohammad Reza
   Engineering Optimization (2016)

Powered by: Recommended

SPRINGER NATURE

© 2017 Springer International Publishing AG. Part of Springer Nature.

Not logged in Not affiliated 212.80.12.119