Optimum availability and security for IMS-based VOIP networks using weight product method

Salgaonkar Krishnaji Atmaram
SSt College of Arts and Commerce, Maharashtra, India.
Email: krishnajisalgaonkar@sstcollege.edu.in

Abstract

IMS is a set of specifications for delivering multimedia services over the IP protocol. It makes it possible to integrate all kinds of services like voice, multimedia and data on a platform accessible through any internet connection. Intramuscular stimulation (IMS) is a technique used by physical therapists that have completed IMS certification to release or stretch muscles that may be causing chronic musculoskeletal or neuropathic pain. Turn off the device. Volume Up key and Home key Press and hold, then press and hold the Power key. When the Android logo is displayed, press all keys to let go The IP Multimedia Subsystem or IMS stands for IP Voice, video, and text messaging over networks for providing multimedia communication services such as A standards-based architectural framework. As you know all IMS messages are carried over TCP or UDP sockets in the form of IP data. Therefore, IP level security can be used for IMS/SIP transactions if required. To enable IP level security, we need to go through the SA process and exchange key exchange process. Internet Mail Service (IMS) is internal to Compaq Messaging and is an important part of the infrastructure. Compaq has at least three Exchange server companies There are two companies that support large users And third company houses the servers and global sites of Compaq Services consulting groups. The weighted product (WP) method is a part of the decision-making model by multiplying the attribute evaluation. Weights for attributes are for attributes is positive in the multiplicative function between Acts as ranking, while attribute rating Cost acts as a negative ranking for the attribute. Alternative: Global priority, Economic, Environmental and Social. Evaluation Option: Materials, Energy, Water, Emissions, Emissions, Effluents and waste, Products and services. Result: As a result, waste and waste rank first have received; while at the same time the goods received are less have been ranked. The value of the dataset for IMS Security in Weighted product method shows that it results in Effluents and waste and top ranking.
Key words: Global priority, Economic, Materials, Energy, Emissions.

Introduction

A third goal of IMS is to provide many different services A framework for effective coordination To provide, they meet user needs Easy to mix and match. IMS is traditional The need to develop stove pipe applications is Designed to be removed, it is in one use All aspects should be covered and Cannot be easily integrated with other applications. [1] Although standards provide multiple SMS security options for carrier networks, the flexibility to enable carriers to accommodate the diversified Service requests from mobile users to carriers and strict security for both mobile users are Susceptible to threats. SMS-enabled service Providers protect themselves against traditional SMS threats but still rely on the security used. [2] For each phone call in these records Contains all the necessary information: in particular, the Sender and receiver, start time, end time, and Status of the call. SAD is an existing IMS Protecting CDR with minimal impact on infrastructure an anomaly that can be analyzed in perspective is developed as a diagnostic tool. [3]. the purpose of security analysis is an end-to-end Up to IMS-based VoIP network architecture and includes the entire X.805 security architecture When expanded, though less analytical, Effects at every layer, plane, and dimension are identified. A unified IP of packetized voice across the network for transportation. [4] Interrogative Call session control functions. This element is IMS the entity responsible for roaming assurance in the framework indicates. It sends SIP routing requests to the appropriate S- Allows for CSCF. I-CSCF consults S-CSCF SIP the HSS base determines the address of the initialization processing the request. [5] Items aim for security nodes on a hop-by-hop basis Integrity for signaling messages between and to provide confidentiality. (ESP) protocol is the main means of achieving this objective. Due to its nature as an application-layer protocol, SIP signaling should have no impact. [6] Security of IMSI is considered to be the most critical issue at UMTS. So, send the IMSI as infrequently as possible to the computer Use is an attempt by the designers has been carried out. Instead, they are called TMSIs Temporary identities for users are distributed, and then all of them also used for signals communications. [7] IMS uses about home network and visited network a familiar concept. Whether the user is roaming or not There are two different scenarios depending on the First In the case of a user with IMS called proxy-state The first contact control function is Home located in the network and the second In the circumstances, where the B-CSCF visited located. [8] Because of These characteristics of SIP are geographically dispersed The IMS signaling center intercepts its traffic and is Vulnerable to manipulation or deception. Also, IMS signaling cores are geographically Vulnerable. [9] For combat operators, this advances the concept of layering by defining a Horizontal where common functions can be used IMS stacking by defining architecture Improves perception. A horizontal IMS framework, interoperability, and roaming bearing control, charging, and providing certain

security services. [10] These measures target known security issues from GSM networks and the Internet heritage of IMS Ignore it. Basically, IMS is an open, IP- based, multiple services with the powerful signal in the site mechanisms, [11] The OWSAP risk assessment system provides a framework To overcome this deficiency. It provides a flexible component known as a "weighting factor" for impacts and business impact so that an organization can choose the appropriate weighting factors for its own needs. Introduces a methodology for analyzing Business impact of security breaches an organization [12]. We are IMS systems and three services Implemented: IM, Conference, and Venue. organization and In terms of service, we offer several internet services We have created the SaaS level, which is for the service user Three to provide different customized services are virtualized into six, security is in place Concerns. [13] This fact makes IMS networks vulnerable to specific security weaknesses associated with other IP networks and MS protocols such as SIP. The key used by the client to establish a session with MS Core This is the last protocol. For that reason, we focus our work on ethics we pay. [14] Because each organization is unique, they affect each organization differently; All important business for all companies "A scale" for analyzing processes as well "A scale" for analyzing processes as well By customizing according to the needs of the company IMS to consider such variations is designed. [15]

Methods & materials

In the MCDA, many make decisions Weight for criteria Many methods to assign Are used. This In methods, relative evaluations a simple one. In comparative estimation mode, According to the estimated value Results Criteria Are sorted. Because, in practice the decision maker is many to decision-making criteria assigning numeric weight not possible. Therefore each in this manner the weight of the scale Of the evaluation of the scale Basically calculated, Because of the rating sequence Basically multiple criteria The decision maker to arrange Is very comfortable. Of each criterion Different during evaluation Final criteria this method for comparison used. Here Of overweight first assessment Criterion and vice versa is provided. I.e. This method is weight estimation is a mixture of relationships. Weighted production method Such as. The main difference what, in this model Multiplication instead of addition is. Every replacement Multiplied by several ratios compared to others. To measure accuracy, WP and algorithms Supports decision making using an application system has been created. Thirty Student data According to their rankings Calculated. Exact rankings of two methods of prediction Data to determine percentage Calculated, from which Of two methods Accuracy and low Error rates were obtained. Web-based education or e-learning The Internet is significant in establishing has had an impact. Internet technology and Evolution of e-commerce all industry and Business operations affected and e-learning the growth of the sector has accelerated. Information The size of the transaction and Increasing speed By the way, knowledge management And transfer tasks And by simplification Education and the Internet For technology Inter-cooperation It was inspiring. E-learning is for many companies Training at work to deliver, money save, staff Time and other expenses one for smuggling is the alternative way

Materials: Written material means letters, notes, reports, memos, notebooks, account books, data, drawings, prints, plans, specifications, formulas and all other documents or writings and all copies, including those stored in electronic media formats.

Energy: Everything what we eat, consume, or use is energy is fuel and the body's natural interior Regulates activities. It is the cells and the body that Repairs tissue, used to build muscle, and more It is necessary to maintain homeostasis - and Maintaining a harsh environment requires a lot of energy.

Water: Keep Normal temperature. Lubricate and cushion joints. Your Protect the spinal cord and other sensitive tissues. Through urination, perspiration, and bowel movements Eliminate waste.

Emissions: Emissions are emitted substances; In the energy sense, these are Mostly aimed at gaining gainful employment and are the waste products of a process containing The most common emissions from energy are electricity generation and transport, and transportation of people are associated with goods.

Effluents and waste: Effluent comes from the Latin verb "to flow out". In the old sense, sewage is a stream that flows out of a river or lake. But in today's era, sewage always refers to the waste that ends up in our water and air. Liquid industrial effluents, fumes and raw sewage can all be termed sewage.

Products and services: What are goods and services? Products are generally tangible goods – your Customers are physically in their hands and Retainable. Your company is branded swag and sells merchandise to other businesses. Services are generally intangible – you provide or something was done to another person.

Analysis and Dissuasion

TABLE 1. IMS Security in Weighted product method Data Set

	DATA SET			
	Global priority	Economic	Environmental	Social
Materials	61.08	659.53	49.15	232.05
Energy	47.12	772.97	73.69	37.30
Water	64.08	582.58	59.18	73.10
Emissions	73.17	778.28	46.60	87.59
Effluents and waste	63.33	486.41	47.96	34.59
Products and services	37.44	667.31	27.19	54.66

This table 1 shows that the value of dataset for IMS Security in Weighted product method Alternative: Global priority, Economic, Environmental and Social. Evaluation Option: Materials, Energy, Water, Emissions, Emissions, Effluents and waste, Products and services.
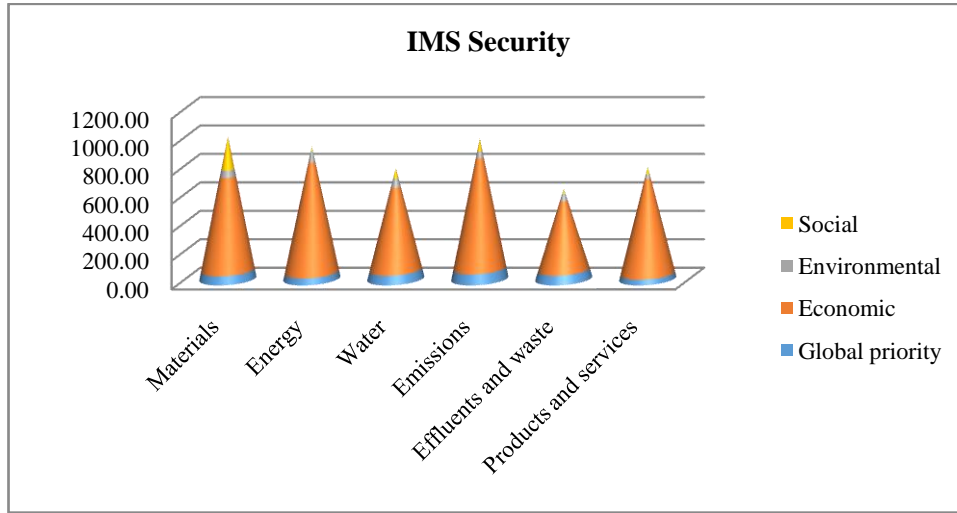
FIGURE 1. IMS Security

This Figure 1 shows that the value of dataset for IMS Security in Weighted product method Alternative: Global priority, Economic, Environmental and Social. Evaluation Option: Materials, Energy, Water, Emissions, Emissions, Effluents and waste, Products and services.

TABLE 2. IMS Security in Performance value

	Performance value			
Materials	0.8348	0.8474	0.9481	0.14906
Energy	0.644	0.9932	0.6324	0.92735
Water	0.8758	0.7485	0.7874	0.47319
Emissions	1	1	1	0.39491
Effluents and waste	0.8655	0.625	0.9716	1
Products and services	0.5117	0.8574	1.7139	0.63282

This table 2 shows that the values of IMS Security in Weighted product method for Performance value using Weighted product method Find the pair wise comparison value for Materials, Energy, Water, Emissions, Emissions, Effluents and waste, Products and services.
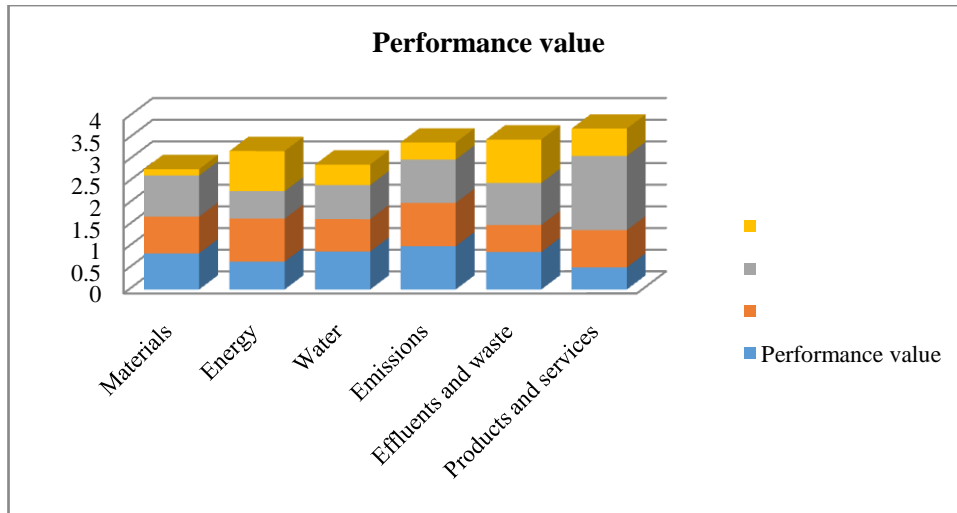

FIGURE 2. Performance value

This figure 2 shows that the values of IMS Security in Weighted product method for Performance value using Weighted product method Find the pair wise comparison value for Materials, Energy, Water, Emissions, Emissions, Effluents and waste, Products and services.

TABLE 3. IMS Security in Weighted product Weight age

Weight			
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25

This table 3 shows that the values of IMS Security in Weighted product method for Weight age using Weighted product method Find the pair wise comparison value for Materials, Energy, Water, Emissions, Emissions, Effluents and waste, Products and services.

TABLE 4. IMS Security in Weighted normalized decision matrix

Weighted normalized decision matrix			
0.9559	0.9595	0.9868	0.6214
0.8958	0.9983	0.8918	0.9813
0.9674	0.9302	0.942	0.8294
1	1	1	0.7927
0.9645	0.8891	0.9928	1
0.8458	0.9623	1.1442	0.8919

This table 4 shows that the values of IMS Security in Weighted product method for Weighted normalized decision matrix using Weighted product method Find the pair wise comparison value for Materials, Energy, Water, Emissions, Emissions, Effluents and waste, Products and services.

TABLE 5. IMS Security in Weighted product Preference Score

	Preference Score
Materials	0.562307674
Energy	0.7825814
Water	0.703012946
Emissions	0.792727654
Effluents and waste	0.85145647
Products and services	0.83054477

This table 5 shows that from the result it is seen that Materials =0.562307674, Energy = 0.7825814, Water = 0.703012946, Emissions = 0.792727654, Effluents and waste = 0.85145647, Products and services = 0.83054477.
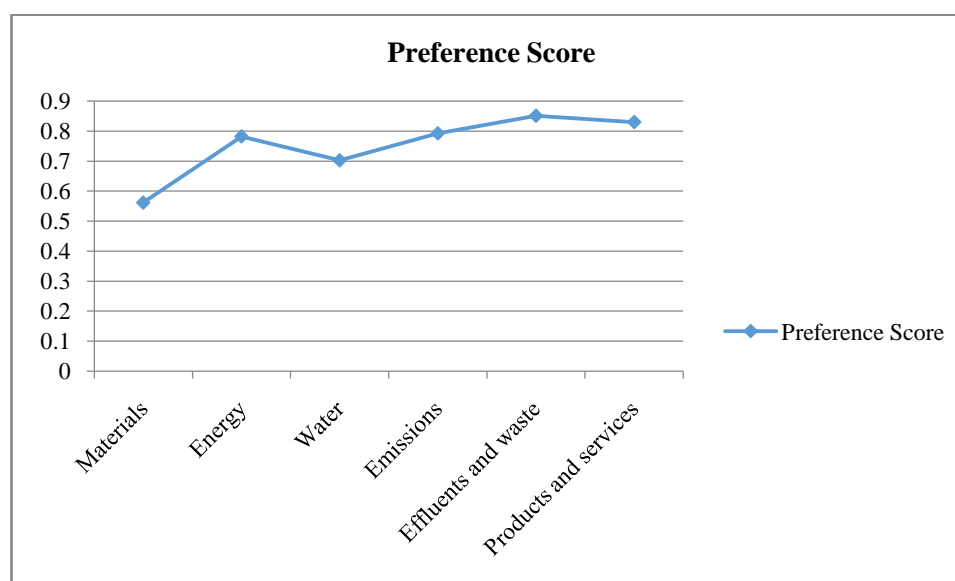

FIGURE 3. Preference Score

This From the end of Figure 3, it seems that shows Materials =0.562307674, Energy = 0.7825814, Water = 0.703012946, Emissions = 0.792727654, Effluents and waste = 0.85145647, Products and services = 0.83054477.

TABLE 6. IMS Security in Rank

	Rank
Materials	6
Energy	4
Water	5
Emissions	3
Effluents and waste	1
Products and services	2

This table 6 shows that As a result, waste and waste rank first have received, while at the same time the goods received are less have been ranked.
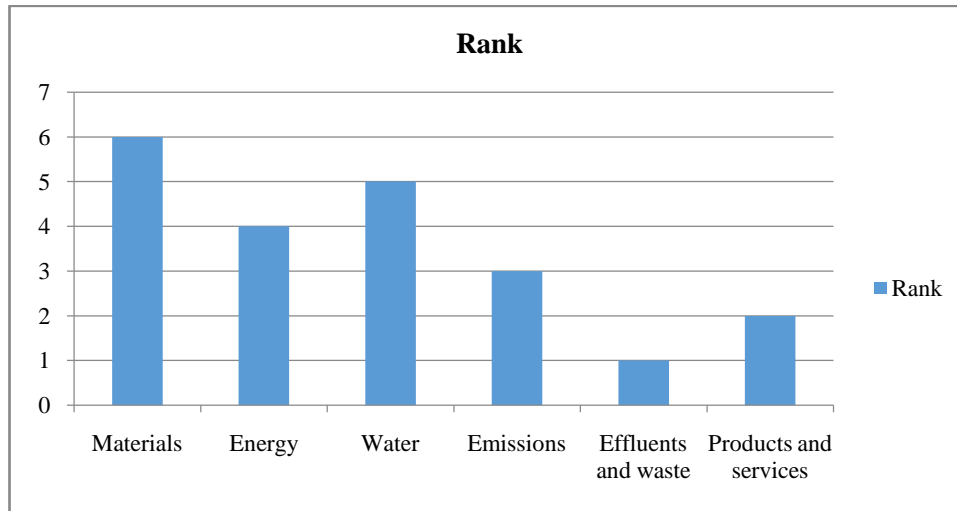
FIGURE 4. IMS Security in Rank

This figure 4 shows that As a result, waste and waste rank first have received, while at the same time the goods received are less have been ranked.

Conclusion

As a result, waste and waste rank first at the same time, the materials are fewer Ranks. Secure implementation of IMS, There is many challenges in deployment and deployment. The of all concerned parties the solution calls for concerted efforts. Any party that does not implement the required security measures in a timely manner may pose security threats and unexpected damages. Medium-sized compared to other security solutions Millions of voices in a few hours on server Calls can be analyzed, however, this is A very powerful way to expand time can be reduced by using engine. Using a Security domain assessment, critical threats and their impacts on sample availability we determine impact. Service availability security features that can use the standard. For combat operators, this advances the concept of layering by defining a Horizontal where common functions can be used IMS stacking by defining architecture Improves perception. A horizontal IMS framework, interoperability, and roaming bearing control, charging, and providing certain security services. These measures target known security issues from GSM networks and the Internet heritage of IMS Ignore it. Basically, IMS is an open, IP-based, multiple services with the powerful signal in the site mechanisms, The weight of the scale Of the evaluation of the scale Basically calculated, Because of the rating sequence Basically multiple criteria The decision maker to arrange Is very comfortable. Of each criterion Different during evaluation Final criteria this method for comparison used. Here Of overweight first assessment Criterion and vice versa is provided. I.e. This method is weight estimation is a mixture of relationships. Weighted production method Such as. The main difference what, in this model Multiplication instead of addition is. Every replacement Multiplied by several ratios compared to others.

References

1. Aminudin, Nur, EniSundari, K. Shankar, P. Deepalakshmi, Rita IrvianiFauzi, and AndinoMaseleno. "Weighted Product and its application to measure employee performance." International Journal of Engineering & Technology 7, no. 2.26 (2018): 102-108.
2. Wang, Mingxi, Shulin Liu, Shouyang Wang, and Kin Keung Lai. "A weighted product method for bidding strategies in multi-attribute auctions." Journal of Systems Science and Complexity 23, no. 1 (2010): 194-208.
3. Das, Bijoy, SumanSankarBhunia, Sarbani Roy, and Nandini Mukherjee. "Multi criteria routing in wireless sensor network using weighted product model and relative rating." In 2015 Applications and Innovations in Mobile Computing (AIMoC), pp. 132-136. IEEE, 2015.
4. Mateo, José Ramón San Cristóbal. "Weighted sum method and weighted product method." In Multi criteria analysis in the renewable energy industry, pp. 19-22. Springer, London, 2012.
5. Fitriasari, Novi Sofia, SyifaAfifahFitriani, and Rosa ArianiSukamto. "Comparison of weighted product method and technique for order preference by similarity to ideal solution method: Complexity and accuracy." In 2017 3rd International Conference on Science in Information Technology (ICSITech), pp. 453-458. IEEE, 2017.
6. Divayana, D. G. H., A. Adiarta, and I. B. G. S. Abadi. "Initial draft of CSE-UCLA evaluation model based on weighted product in order to optimize digital library services in computer college in Bali." In IOP Conference Series: Materials Science and Engineering, vol. 296, no. 1, p. 012003. IOP Publishing, 2018.
7. Listyaningsih, Vickky, HendraSetiawan, EkoSudrajat, and Ryan PutrandaKristianto. "DssPemilihanPenerimaBantuanPerbaikanRumahDenganMetode WEIGHTED PRODUCT." SEMNASTEKNOMEDIA ONLINE 5, no. 1 (2017): 3-5.
8. Khairina, Dyna Marisa, Muhammad ReskiAsrian, and HelizaRahmaniaHatta. "Decision support system for new employee recruitment using weighted product method." In 2016 3rd International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE), pp. 297-301. IEEE, 2016.

9. Boltürk, Eda, Ali Karaşan, and CengizKahraman. "Simple additive weighting and weighted product methods using neutrosophic sets." In Fuzzy Multi-criteria Decision-Making Using Neutrosophic Sets, pp. 647-676. Springer, Cham, 2019.

10. Hunter, Michael T., Russell J. Clark, and Frank S. Park. "Security issues with the IP multimedia subsystem (IMS)." In Proceedings of the 2007 Workshop on Middleware for next-generation converged networks and applications, pp. 1-6. 2007.

11. Tu, Guan-Hua, Chi-Yu Li, Chunyi Peng, Yuanjie Li, and Songwu Lu. "New security threats caused by IMS-based SMS service in 4G LTE networks." In Proceedings of the 2016 ACM SIGSAC Conference on Computer and Communications Security, pp. 1118-1130. 2016.

12. De Lutiis, Paolo, and Dario Lombardo. "An innovative way to analyze large ISP data for IMS security and monitoring." In 2009 13th International Conference on Intelligence in Next Generation Networks, pp. 1-6. IEEE, 2009.

13. Pant, Himanshu, Andrew R. McGee, Uma Chandrashekhar, and Steven H. Richman. "Optimal availability and security for IMS- based VoIP networks." Bell Labs Technical Journal 11, no. 3 (2006): 211-223.

14. Bahnasse, Ayoub, Mohamed Talea, Fatima Ezzahraa Louhab, Sara Laafar, Adel Harbi, and Azeddine Khiat. "SAS-IMS for smart mobile security in IP multimedia subsystem." In Proceedings of the 2017 International Conference on Smart Digital Environment, pp. 35-41. 2017.

15. Xu, Fangmin, Luyong Zhang, and Zheng Zhou. "Interworking of Wimax and 3GPP networks based on IMS [IP Multimedia Systems (IMS) Infrastructure and Services]." IEEE Communications Magazine 45, no. 3 (2007): 144-150.

16. Kambourakis, Georgios, Constantinos Kolias, Stefanos Gritzalis, and Jong Hyuk Park. "DoS attacks exploiting signaling in UMTS and IMS." Computer Communications 34, no. 3 (2011): 226-235.

17. Sher, Muhammad, Thomas Magedanz, and Walter T. Penzhorn. "Inter-domains security management (IDSM) model for IP multimedia subsystem (IMS)." In First International Conference on Availability, Reliability and Security (ARES'06), pp. 8-pp. IEEE, 2006.

18. Tirado, Ivan. "IP Multimedia Subsystem (IMS) signaling core security." In Proceedings of the 5th annual conference on Information security curriculum development, pp. 59-63. 2008.

19. Maachaoui, M., A. Abou El Kalam, and A. Ait Ouahman. "Model-based security analysis for IMS network." In 2011 International Conference on Multimedia Computing and Systems, pp. 1-6. IEEE, 2011.

20. Jung, Oliver, Andreas Berger, Michael Hirschbichler, Ivan Gojmerac, Hans Lippitsch, Mario Tscherwenka, and Klaus Umschaden. "IMS security and what we should learn from the Internet." e & i Elektrotechnik und Informationstechnik 127, no. 5 (2010): 116-120.

21. Vijayaraghavan, V., and Sanjoy Paul. "iMeasure security (iMS): A novel framework for security quantification." In 2009 First International Conference on Networks & Communications, pp. 414-421. IEEE, 2009.

22. Zhien, Guo, and Dai Yiqi. "Security SLAs for IMS-based cloud services." In 2012 Seventh ChinaGrid Annual Conference, pp. 57-60. IEEE, 2012.

23. Belmekki, Elmostafa, Brahim Raouyane, Abdelhamid Belmekki, and Mostafa Bellafkih. "Secure SIP signalling service in IMS network." In 2014 9th International Conference on Intelligent Systems: Theories and Applications (SITA-14), pp. 1-7. IEEE, 2014.

24. Vijayaraghavan, V., Sanjoy Paul, and N. Rajarathnam. "iMeasure Security (iMS): A Framework for Quantitative Assessment of Security Measures and its Impacts." Information Security Journal: A Global Perspective 19, no. 4 (2010): 213-225.

25. Lee, Sangil, Kwangyeol Ryu, and Moonsoo Shin. "The development of simulation model for self-reconfigurable manufacturing system considering sustainability factors." Procedia manufacturing 11 (2017): 1085-1092.