The Effect of Traffic Intensity in Social Networking with a Special Reference to Whats App: A Case Study

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Abstract:

Now-a-days people are expressing their feelings or emotions like happiness, sadness, anxieties etc. with others, through social media. Most of the people in the world have been giving lot of importance to social media. People like to share their feelings through social media applications such as Facebook, twitter, Whats App etc. Social media plays a vital role in the present human being's life scenario. People want to share their memorable events such as birthday, marriage, engagement, job, promotions etc. among all social media applications of which mostly used by the people is Whats App. In this research paper we have obtained *The Effect of Traffic Intensity in Social Networking with a special reference to Whats App:A Case Study* and the status of viewers' data from a social media application and analysed the characteristics of queuing in social platform.

Keywords: Social media, WhatsApp, Arrival rate, Service time, Utilization factor.

1) Introduction:

Now-a-days people are able to live without food but not without social media. People are ready to express their feelings, emotions etc. to others and they are also very curious to know about others' things. Through social media people are getting a lot of information, even in every second of their life. In social media there are various number of chatting applications. Whats App has been using by the people with various purposes, to exhibit their hidden talents, to promote business, for advertising, improving business circles, campaign purpose for politicians etc.

In Whats App, there are many features. Among them, the status has been used by the users a lot. In the status people share their photos, videos, messages, clips, locations, documents etc.

The status feature in the Whats App has become famous. The photo/video shared in status will be available for 24 hours only, afterwards it will be disappeared. People have a lot of interest to view the status of their friends, relatives, etc. People are very active online and having a lot of interest to view the status. The videos and photos which are uploaded not viewed by others instantly because there is always Traffic Intensity occur in the Network.

Queuing theory is a division for acquiring operations research that is used to examine the awaiting line. Initially it was introduced by Danish telecommunication technocrat, A.K. Erlang. This application has been used in telecommunication, supermarkets, hospitals, machine repairing shops, ATM centres, cinema theatres, social media etc. The ratio of arrival rate to the service rate is traffic intensity.

2) Queuing Theory:

In human daily life a wide-ranging platform is queues. The waiting lines are made when the immediate service for the customer is not available.

2.1.1 Assumptions of Queuing System:

1) The arrival time is Poisson distribution

2) Service time is exponential distribution.

2) Infinite customers are allowed in system.

6) Sufficient are is provided for waiting.

7) First cum first serve will be queue discipline.

2.1.2 M/M/I queuing model:

M/M/1 queuing model means that the arrival and service time are exponentially distributed (Poisson process). For the analysis of the M/M/1 queuing model, the following variables will be investigated:

- λ =The mean customer's arrival rate (1)
- μ = The mean service rate
- Utilization factor

$$\boldsymbol{\rho} = \frac{\lambda}{\mu} \quad (2)$$

- Probability of zero customers in the hospital:

$$\mathbf{P_0} = 1 - \boldsymbol{\rho} \quad (3)$$

- The probability of having *n* customers in the hospital:

$$\mathbf{P_n = \rho^n P_0 = \rho^n (1-p) \quad ; \rho < 1, n \geq 0} \quad (4)$$

- The average number of custom ers in the hospital:

$$\mathbf{Ls} = \left(\frac{\boldsymbol{\rho}}{\mathbf{1-\rho}}\right) \quad (5)$$

- The average number of customers in the queue:

$$\mathbf{L_q} = \left(\frac{\boldsymbol{\rho}^2}{\mathbf{1-\rho}}\right) \quad (6)$$

- The average waiting time in the queue:

$$\mathbf{W_q} = \frac{\lambda}{\mu\,(\mu-\lambda)} \quad (7)$$

- The average time spent in the hospital, including the waiting time:

$$\mathbf{W_s} = \frac{\mathbf{1}}{(\mu - \lambda)} \quad (8)$$

2.1.3 Observations:

We have collected the entire data which we produced here in a period of 1 week. During this one-week period, we have observed the data at the end of the everyday (at night) from our WhatsApp status. The total number of viewers during this particular time is shown below:

Table 1: Users viewed status in time

Time in minutes	**No. of customers viewed status**
Start of peak hours (Below 2 hours)	66
After 4 hours	75
After 6 hours	75
After 8 hours	75
After 10 hours	75
After 12 hours	79
After 14 hours	84
After 16 hours	86
After 18 hours	88
After 20 hours	90
After 22 hours	94
After 24 hours	96

3) Results and Discussions:

3.1 Arrival Rate:

$\lambda_1 = \frac{75-66}{120} = \frac{9}{120} = 0.075$

$\lambda_2 = \frac{75-75}{120} = \frac{0}{120} = 0$

$\lambda_3 = \frac{75-75}{120} = \frac{0}{120} = 0$

$\lambda_4 = \frac{75-75}{120} = \frac{0}{120} = 0$

$\lambda_5 = \frac{79-75}{120} = \frac{4}{120} = 0.0334$

$\lambda_6 = \frac{84-79}{120} = \frac{5}{120} = 0.0417$

$\lambda_7 = \frac{86-84}{120} = \frac{2}{120} = 0.0167$

$\lambda_8 = \frac{88-86}{120} = \frac{2}{120} = 0.0167$

$\lambda_9 = \frac{90-88}{120} = \frac{2}{120} = 0.0167$

$\lambda_{10} = \frac{94-90}{120} = \frac{4}{120} = 0.0334$

$\lambda_{11} = \frac{96-94}{120} = \frac{2}{120} = 0.0167$

Average Arrival rate = λ = 0.0227 viewers/minute

3.2 Service Rate:

L = λ T = 0.0227 X 120 = 2.724 customers / minute

$\mu = \frac{\lambda\,(1+L)}{L} = \frac{0.0227\,(1+2.724)}{2.724} = 0.0310$

$\rho = \frac{\lambda}{\mu} = \frac{0.0227}{0.0310} = 0.7322$

$P_0 = 1 - \rho = 1 - 0.7322 = 0.2678$

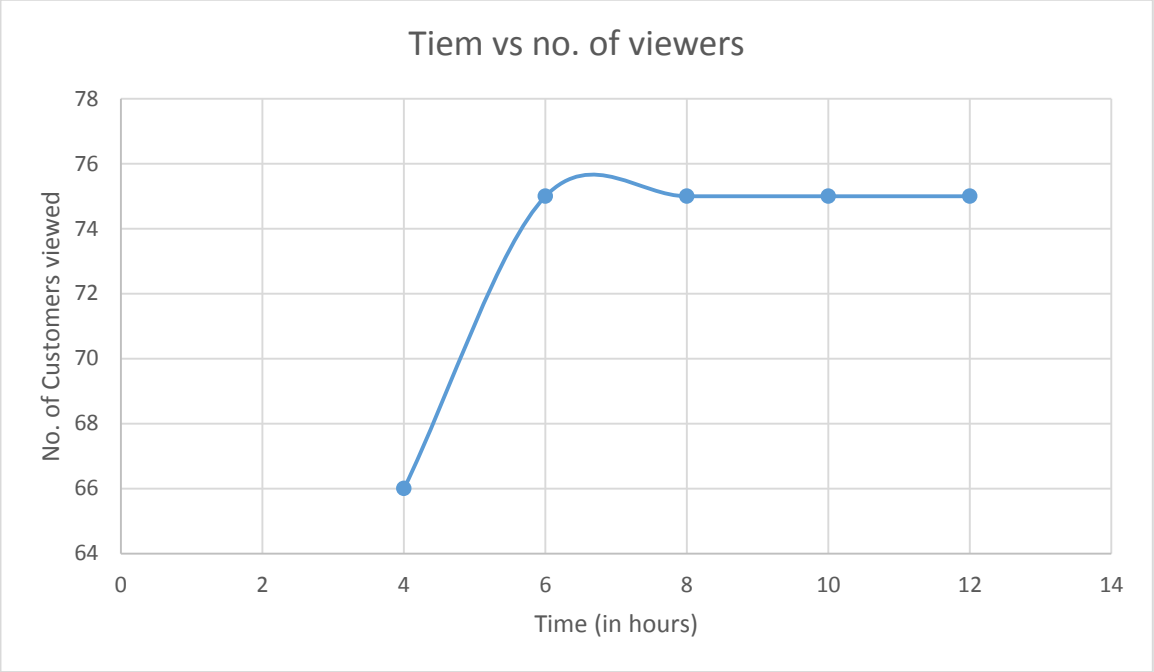
$P_n = P_0\,\rho^n = 0.2678(0.7322)^n$

$L_q = \frac{\lambda^2}{\mu\,(\mu-\lambda)} = \frac{0.0227^{\,2}}{0.0310\,(0.0310-0.0227)} = \frac{0.00051756}{0.0310\,(0.0083)} = \frac{0.00051756}{0.0002573} = 2.01150$

$W_q = \frac{L_q}{\lambda} = \frac{2.01150}{0.0227} = 88.6123$

$W = \frac{1}{(\mu-\lambda)} = \frac{1}{(0.0310-0.0227)} = \frac{1}{0.0083} = 120.4819$

Percentage of Idle = P_0 X 100 = 0.2678 X 100 = 26.78 %



4) Conclusion:

We concluded that the percentage of idle workstation (26.78 %) is very high. And utilization factor (ρ = 0.7322) is very high so it needs some improvement in the service facility.

In my opinion, people have been giving a lot of importance to social media (Whats App). Recently, I did a survey with my Whats App status. From that survey, I came to know about that the people have been giving a lot of time & importance to view the status, chat, and send/receive messages. They are giving importance to know about others' personal life, but not considering about their personal life, career and development.

5) References:

1) Naveen Kumar and Sudhansh Sharma, Indira Ghandi Open University "Suvey Analysis on the usage and impact of whatsapp messeger". Global Journal of Enterpice Information System, 2016.
2) Noa Aharony and Avi Zion "effects of whatsapp use on working memory performance in youth" Journal on Educational Computing Research, Jan 23 2018.
3) What Makes Smartphone Users Satisfied with the Mobile Instant Messenger? Social Presence, Flow, and Self-disclosure Seongwon Park1, Kwangsu Cho1and Bong Gyou Lee International Journal of Multimedia and Ubiquitous Engineering. 2014; 9(11):315–24
4) Impact of WhatsApp Messenger Usage on Students Performance in Tertiary Institutions in Ghana Johnson Yeboah (Lecturer)*George Dominic Ewur (Lecturer) Journal of Education and Practice. Available from: www.iiste.org. 2014; 5(6). ISSN 2222-1735 (Paper) ISSN 2222-288X (Online) Vol.5, No.6, 2014.
5) WhatsApp: A Trend Setter in Mobile Communication among Chennai Youth Ms. Jisha K1, Dr. Jebakumar , IOSR Journal Of Humanities And Social Science (IOSR-JHSS). 2014 Sep; 19(9), VII:01-06 . e-ISSN: 2279-0837, p-ISSN: 2279-0845.
6) Neelamalar, M., & Chitra, P. (2009). New media and society. Education and communication, [cited 2009 Dec 9]; 6(1), 125-45. Available from: URL: http://www.ecn.edu; Retrieved on Octuber8th, 2014.

7) William L, Wilkin. (2009). Negative impacts of internet use. Curr opin psychiatry, 22(4), 351-6. [cited 2010 Apr 23]; Retrieved 7th January 2014 from: URL: http://www.medscape.com
8) Lavalekar, A. (2009). Social awareness in relation to media among high school students. Psychological studies [cited 2010 May 23]; 45(3), 178-80, Available from: URL: http://www.nipccd.nic.in Retrieved on 4th February, 2015
9) Yusuf, M,O, & Afolabi, A.O. (2010). Effects of CAT on secondary school students performance. Turkish journal of educational technology. [2010 Jan 23]; 9(1), 63-9. Available from: http://www.tojet.net; Retrieved on 2nd January, 2015.
10) Yeboah Johanson&Ewur Dominic George 2014).The impact of whatsapp messenger usage on students performance .journal of education and practice .vol 4 no 6 2014.
11) Dr.maniar Avani& Ms Modi Anal (2013)Whatsapp and youth, EXCEL International Journal of Multidisciplinary Management Studies,vol 3 2013.
12) Church Karen&Oliveira de Rodrigo,What's app with whatsapp? comparing mobile instant messaging behaviors with traditional sms,mobile HcI(2013)collaboration and communication .p.g,352to 361
13) Ito, M. Mobile phones, japanese youth, and there-placement of social contact. Mobile Communications (2005), 131–148.
14) Ghanem, R. (2012, September 24). Social media connecting people. Saudi Gazette. Retrieved from http://www.saudigazette.com.sa/index.cfm?method=home.regcon&contentid=20120924137282
15) Beer, David. (2008). Social network(ing) sites...revisiting the story so far: A response to Danah Boyd &Nicole Ellison. Journal of Computer-Mediated Communication, 13 (2), 516-529
16) Lavalekar, A. (2009). Social awareness in relation to media among high school students. Psychological studies [cited 2010 May 23]; 45(3), 178-80, Available from: URL: http://www.nipccd.nic.in Retrieved on 4th February, 2015.
17) Donath, B. (2011). The communication systems integrating social network ties. Perspectives online, [cited 2011 Jan 7]; 1(2), 10-5, Retrieved October 5th, 2014 from: http://www.seer.perspectivasonline.com
18) Ranade, M.D. (2008). Science teaching through computer assisted instruction. Research findings and insights. [Cited 2009 Aug 29]; 17(1), Available from: URL: http://www.hbcse.res.in; Retrieved January 21st, 2015.
19) Hinduja S.,Patchin J(2007);offline consequences of online Victimization: Schooly Violence and delinquency :journal of S.violence.2007:6(3)89-112
20) B. Karthikeyan, K. Alhaf Malik, D. Bujji Babbu, K. Nithya, S. Jafar Ali Ibrahim, N. S. Kalyan Chakravarthy (2021) "Survey of Cooperative Routing Algorithms in Wireless Sensor Networks", *Annals of the Romanian Society for Cell Biology*, pp. 5316–5320. Available at: https://www.annalsofrscb.ro/index.php/journal/article/view/702
21) Elayaraja, D, Ibrahim, S. Jafar Ali. "Design Parametric Optimization Of Wall Following Robot." *Turkish Journal of Computer and Mathematics Education (TURCOMAT) 12, no. 8 (2021): 2072-2080.* https://doi.org/10.17762/turcomat.v12i8.3424