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Digital Natives: Its Characteristics and Challenge to the Library Service Quality Siana Halim1,*, Felecia1,Inggrid2, Dian Wulandari3, and Demmy Kasih1 1 Industrial Engineering Department, Petra Christian University Surabaya 2 Business Management Department, Petra Christian University Surabaya 3Petra Christian University Library, Surabaya * Corresponding E-mail: halim@petra.ac.id Abstract. Digital natives which always connect to the world through their gadg- ets have special needs for gathering information. Do libraries which in the past can be said as the sources of information can satisfy their needs? What should libraries do, so that they can answer those needs? Those queries are the prominent questions to be answered in this paper. In this paper we describe the digital natives' charac- teristics when they use their PC and gadgets. The data were collected from 460 university students in Surabaya. We also measure the library service quality (LibQual) for five university libraries in Surabaya. Moreover, using K-means, we also clustered the respondents into two groups, i.e, the first group is the ones who attach to their gadgets, and the second group is the ones who do not attach to their gadgets. For the first groupthe library online information and for the second group, the operational service are the most important factors for measuring the LibQual. Keywords: Digital native, LibQual, clustering, k-means, structural equation modeling. 1. Introduction Digital native or net generation is a generation which was born after 1994. Marc Prensky[1] defines the digital native as the young generation that "native" in the language of computers, videos, videos games, social media and other sites on the internet. The digital natives have their own ways to gain the information. They con- nected to the world through their gadgets. Oblinger and Oblinger[2] states that the digital natives are digital literate, connected, immediate, experiential, prolific com- municators (social), work in a team, their preference is for structure rather than am- biguity, oriented toward making observations, visual and kinesthetic, take part in the community activities. Digital natives are nontraditional learners [2]. 2 Library as a collection of sources of information, archives and databases faces a new challenging to be existed in the digital era. The Digital natives recognize that library is very important, but internet promises ease and fast access. Search engine overcomes library in term of reliability, cost effectiveness, easiness to use, comfort and speed (de Rosa et al. [3]) Lippincot [4] reported that by the end of the year 2005, the University of South- ern California's Library has been visited for more than 1.4 million visitors. From 2009 to 2012, the physical visitors of the Petra Christian University (PCU) library were decreasing. In 2009 the rate of the visitor is 431 persons per day but in 2012 it becomes 384 persons per day (Wulandari [5]). In this recent year, the physical vis- itors of PCU library is increasing but the number of borrowed books is decreasing. Widjaja and Halim [6] reported that the easiness to access the web gives positive effects to the PCU students to visit the library, but the PCU library collections do not give positive effect for the students to visit the library.However, the digital PCU library is accessed for more than 6.7 million visitors per year (Wulandari [7]). This fact shows that library is still important for students, but it has to be developed to satisfy the digital natives' needs. 2. Methods Answering the query which is explained in the introduction, we adapt the Library Service Quality (LibsQual [8]) for the digital natives' nature. There are six factors that measure the LibsQual, i.e., personal control, information access, library as place, affect of service (personal), affect of service (organizational) and interest to visit library (see Figure 1). For each factors, there are several indicators for meas- uring them. To simplify the indicators for each factors, we applied the factor anal- ysis technique (Sharma [9]) before measuring the LibQual models using structural equation

modeling (Hair et al. [10]). This model is applied to two groups of respondents, i.e, digital natives who attach to their gadgets and who do not attach to their gadgets. Those two groups were obtained via clustering analysis method, i.e., k-means (Sharma [9]). We then applied the results of those groups to get the characteristics of each group. Data The data were collected from 460 university students which studies in five uni- versities in Surabaya. Those five universities are InstitutTekonologiSep- uluhNopember Surabaya (ITS), Universitas Pembangunan Nasional-Veteran (UPN), Universitas Kristen Petra (UKP), Universitas Surabaya (UBAYA), Univer- sitasWidya Mandala (UWM). The respondents for each universities are 92 (20%) from ITS, 48 (10.4%) from UPN, 186 (40.4%) from UKP, 87 (18.9%) from UBAYA, 47 (10.3%) from UWM. The proportion of respondents from each university is depend on the size of the library. ITS and UPN are state universities, while UKP, UBAYA dan UWM are private universities. 3 Personal Control Information Library as Affect of Affect of Service Acccess Place Service (Personal) (Organisational) Interest to visit library Library Service Quality Figure 1. Library service quality model 3. Results 3.1 The digital native characteristics Most of the respondents are listening to music (24%), searching information us- ing web (23%), playing games (13%) and writing documents (13%) as their most frequent activities when the use their PC (see Figure 2). Similarly, they use their gadgets frequently are for instant messaging or chatting (13%), emailing (11%), phone (10%), searching information using internet (10%), sending photos or videos (10%) see Figure 3 for the detail. Applying the k-means with 2 classes, i.e, digital natives who attach to their gadg- ets (Cluster 1) and who do not attach to their gadgets (Cluster 2), the Table 1 shows the average of their several activities using their gadgets. It can be clearly seen that those two clusters is very distinct in the ability to use some apps. Digital natives which attach to their gadgets are the one who are powerful in using the apps in their gadgets. The apps here are including instant messaging/chatting (e.g. BBM, WhatsApp, Line, etc), downloading music, uploading foto/videos (Instagram, path), Blogging, Social Media, Phone, Writing diary, searching information through in- ternet access, emailing, saving ebooks/e-resources. There are several variables used in this research for measuring the library service quality. There are eight variables for measuring the personal control, eleven for in- formation access, and twelve for library as place, fourteen for personal affect of service, twelve for organizational affect of service and four for the external factors. Those original variables are then simplified using factor analysis to form a new ones. The new and the original variables are summarized in Table 2. Using the new variables, we then constructed the model. 4 Searching Writing information using documEednittsing web 13%pictures 23% Editi4n%g audio and video Online game 3% 9% Learning using Playing games computer without internet without 13% Listening to internet… music 24% Figure 2. The frequency of using computer Saved e- Instant Email books/e- messanging/ 11% resources chat Searching 7% 13% Download musik information 9% using internet Upload 10% foto/video 9% Diary Active in blog 9% 4% Send photos Write or videos Phone comment 10% 10% 8% Figure 3. The frequency of using gadget Figure 4 and Figure 5 show the result of SEM model for the digital native who attach and who do not attach to their gadgets consecutively. For both clusters the external factor do not contribute to the LibQuality. The external factors measures four factors, i.e., the willingness to visit the library deliberately, library has special interest to be visited, library escalates the academics competency, I go to the library without planning in advanced. This means that even the library itself has good qual- ity in term of others measurement (personal control, information access, aspect of personal, aspect of organizational and library as a place) but without the external factors of the visitors, i.e., the library customer, the library will be empty. 5 Table 1. The average of several activities using gadgets for Cluster1 and Cluster2 Fre- quency Abil- Fre- Abil- Amount of us- ity to Num- quency ity to Read- Buy- of ing use ber of of using use Clus- ing ing Download- Gadgets Gadg- gadg- Social some some ter ebooks books ing ebooks on hand ets ets Media apps apps 1 1,81 0,78 1,36 5,20 2,55 3,60 1,95 6,20 8,82 2 1,48 0,57 0,87 4,86 2,03 1,52 1,64 5,60 1,55 Table 2. The new and the original variables used for the model Factor New variabel The original variables Personal Control PCNEW1: Website and online catalog PCNEW2:Library online information IANEW1:Online and non-online col- Information Access lection IANEW2: Variabel informasi Per- pustakaan Library as Place LPNEW: Library as place Affect of Service (Per- sonal) Affect of Service (Organi- sational) External factors ASPNEW1:The library's staff skill ASPNEW2:Hospitality ASONEW1:Operational service ASONEW2:Library programs MBNEW1 PC1, PC2, PC3, PC4, PC5 PC6, PC7, PC8 IA1, IA2, IA3, IA4, IA5, IA6, IA9, IA10, IA11 IA7, IA8 LP1 - LP12 ASP4, ASP5, ASP6, ASP7, ASP8, ASP9, ASP10, ASP11, ASP12, ASP13 ASP1, ASP2, ASP3, ASP14 ASO1, ASO2, ASO3, ASO5, ASO6, ASO8, ASO9, ASO10 ASO4, ASO7, ASO11, ASO12 MB1, MB2, MB3, MB4 For the digital native who attach to their gadgets (Cluster 1), the information access is the most important factors in the library quality. Additionally the library online information (PCNEW2) are the most influencing indicator for personal con- trol. The PCNEW2 includes the easiness to access the library collection, the library collections suitable with my needs, the availability of online resources that can meet my needs. For the digital native who do not attach to their gadget (Cluster 2), oper- ational service are the most important factors and the ASONEW1 is the most influ- encing indicator for them. The ASONEW1 includes the appropriateness and the punctuality in giving service. For both model the goodness of fit of the model is

acceptable (see Table 3) 6 Figure 4. The SEM for the Digital Native who attach to their gadgets (Cluster 1) Figure 5. The SEM for the Digital Native who do not attach to their gadgets (Cluster 2) Table 3. The goodness of fit test Goodness Re- explana- Model of Fit sult Cut off tion Digital native who at- tach to their gadgets Digital native who do not attach to their gadgets GFI 0,89 AGFI 0,80 GFI AGFI 0,91 0,84 ≥ 0,9 ≥ 0,9 ≥ 0,9 ≥ 0,9 acceptable acceptable acceptable acceptable 7 4. Conclusion In this research the characteristics of the digital natives especially in their habit in using pc and gadgets has been explored. There are two types of digital natives, the ones who attach to their gadgets (Cluster 1) and who do not attach to their gadg- ets (Cluster 2). For the Group1 the library online information and for the Group2, the operational service is the most important factors for measuring the LibQuality. The library has to be innovated such that the external factors that affect the willing- ness the customers to visit the library will be increased. Acknowledgements The authors are very grateful to the Indonesian Directorate of Higher Education (DIKTI) which give the financial support for this research. 5. Reference citations [1] M. Prensky, "Digital Natives, Digital Immigrants",

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