Do Online Activities Still Need Physical Movement? Towards Inclusive Transportation for Indonesian Women Online Communities

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Abstract—**This article aims to complete Manheim's idea in activity of woman online community case in achieving the needs of its members. The factors that influence the decision to perform the movement in an effort to physically attend using linear regression method also reported. This aim is completing the inclusive transportation especially in women participation facilitated by ICT. This study from 441 respondents shows that the decision to attend a face to face meeting is influenced by the factors such as distance, cost, time, mode and benefits. Which may lead to positive and/or negative effect the face to face meeting also raises movement patterns such as the type, frequency and mode they used. This result will imply the development of inclusive women transportation.**

Keywords: **Activity, Woman Online Community, Inclusive Transportation**

I. INTRODUCTION

Transport theory has completed from trip based (Morlok, 1997; Kanafani,1983; Manheim, 1979) become activity based approach (Bowman, 2000; Akiva, 1997). The transportation system by Manheim that consist three elements still relevant to referred in transportation study (see figure 1). The activity system consist travel demand derived from people activity and land use. The activity system produced trip or flow system and facilitated by transportation system. This concept still has a lack because the gender differences in transportation especially in travel behavior remains incomplete. (Hamilton K and Jenkins L 2000). In developing countries, women access participation to development and transportation still has a lack. (Meyers, 2006 ; Peters, 2001). In transportation planning the women travel pattern has a unique and different to men. (MacDonald, 1999; Hanson, 1985). It is important to study about women participation especially in transportation to make inclusive transportation system.

The development of information and communication technology (ICT) has led to a new lifestyle and culture in a society that is known as network society (Castell , 2010; 1989 ;Van Dijk, 2005). This lifestyle has paved the geography boundaries into a network of relationships through the Internet as known as e neighbourhood. (Gamal, 2010; Doulet, 2009; Hampton, 2007) Connectedness on the internet Network is also bringing the death of distance concept (Cairncross, 1997). ICT was believed to change the travel behaviour (Padayhag G U, Daisuke Fukuda, 2011). The e neighbourhood phenomenon caused shifted of the activity system by Manheim. The activity system have not only in real space (geography boundaries) but also happened in virtual space (through by internet services). In Manheim concept, the activity system is in real space only. This is way the Manheim concept need to be completed.
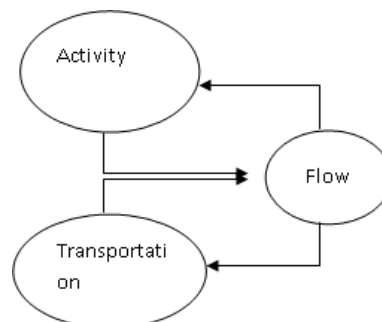

Figure 1. Transportation Interaction System

Source : Manheim, 1979 : 13

The development of ICT is also enjoyed by developing countries such as Indonesia. In Indonesia internet user began to rise rapidly in 1998 (Lim, 2005). The rise of internet user in Indonesia has growth rapidly in 24,23%. This number represent that 63 million of 260 milion people in Indonesia have internet access. This is demonstrated by the fact that Indonesia became the very active user in internet application such as face book, twitter, etc. Face book users in Indonesia was third in the world behind the United States and

Britain with the number of users more than 26 million people. (Social Media World Forum Asia, 2010). Although this fact is still relatively small when compared with the total population of Indonesia, but the symptoms of the use of information and communication technologies in urban areas is still raising.

The ease of application on the internet allows people to form online communities based on similarity and interest (McQuail, 2010; Hummel & Leichner, 2002). Online communities can be formed consisting of many persons, or limited. The existence of online communities can also last a long time or a short time. Activities of members of online communities also vary but are generally in the form to full fill of the needs for information, and knowledge networks. Ease of application on the internet also enables women to better express themselves and open the inclusiveness in participation through the online community. The development of information technology has enabled women to actualize herself. Technology has including women in many variety of aspect. (Gamal, 2007; Hufffaker, D.A., and Calvert, S.L., 2005). Inclusion of this technology was followed by increased role of women in the field of development and transportation. In the field of development of women's participation can be done with information technology facilities such as twitter, face book, blog and so on. In the field of women's participation due to the ease of transportation technology has not been widely studied. Some studies on the influence of information technology in general can lead to a substitution, addition or change the pattern of movement (Mokhtarian, 2002; 2000).

Basically transportation is the movement caused by human activities to meet their needs (Morlok, 1997). Human needs can be met by himself or by another person or group of people in the environment. The women online community is a manifestation of the human need for self-actualization (Maslow in Williams, 1995). In network society era everybody can connect without limitation in the real space. Paved the geographical boundaries and distance, needs couldn't be met in a women online community at all. Someone will be moving when the need for information and knowledge has been accumulated. This accumulation is the result of the person's cognitive information processing (Williams, 1995).

The accumulation of this information than drives someone needs to make a decision to move. This decision is based on consideration of factors driving and inhibiting factors. The driving factor is something that causes a person to perform movement consideration while inhibiting factor is something that raises one's judgment for not doing the movement. In transportation driving factors are often influenced by distance, cost, time and mode (Bowman, 2000; Akiva, 1997). However, in the decision-making of individuals who become members of an online community of women suspected of not only these four factors. There's one other factor that is a benefit or interest rate movements do.

In this study the needs of women in the online community activities will be explored. In addition, this paper will also investigate the factors that influence the decision making of a face to face meeting of the online community of women and explain patterns of movement that occurs due to a face to face meeting in an online community of women based on the type, frequency and the used mode.

II. METHODE

This study begins with a conceptual model of movement patterns as a result of social networking activities based on previous transport theory consisting of Activity Systems, Transportation Systems and Movement System (Manheim, 1979) with the focus on the System Activity and Movement System. In this theory a human activity will cause movement facilitated by the transportation system. The development of the system movement will affect the activity of the system (there is a follow-up activity or development activities) and transportation systems (such as the development of roads and other transport infrastructure). Thus developmental activities and transportation systems / network will affect the development of the movement system. This theory is based on the concept of physical space in which the interaction takes place three systems physically.

The development of system activity is not only influenced by the movement and transportation systems / networks but also by the society of information and knowledge networks facilitated by ICT. The need for information and socializing has led to the online community. The online community needs arising from the information and knowledge in the networking community has activities in the two spaces are in the virtual space and the real space. In these communities interact using ICT in the virtual world, but at any given moment there are activities that still require physical space which resulted in the movement. The process of interaction in virtual space to produce the physical movement of a decision-making process depends on the attributes of actors, fulfilling the needs of the online community of women and barriers as well as the driving factor. This is what affects the cognitive processing of information (Williams, 1995).

Characteristics of movement have paid much more attention in terms of the type of movement (local,

regional, international), movement time (daily, weekly, annually) and the used mode. If this can be identified then it will be explained the implications of the movement caused both of time and location of the goal.

Survey method is used to collect data in online community by online questionnaire. As the sampling frame are two women online communities named Komunitas Emak Emak Bloggers (KEB) and the Komunitas Ibu Hamil (KIH). KEB is an online women blogger community and KIH is pregnancy women community. Informations taken from 196 people from Komunitas Emak Emak Blogger (KEB) and 245 people from Komunitas Ibu Hamil (KIH).

Analysis of the description used to identify the characteristics of the community and meeting the needs of women in the women's online community. Linear regression analysis was performed to determine the factors that influence the decision making of physical movement. To determine the factors that influence the decision to perform a physical encounter with a linear regression analysis the dependent variable was the frequency of face to face meetings and the independent variable is the cost factor, the availability of time, the availability of modes, the distance factor and benefit factors. For more detail information with respect to linear regression analysis, mentioned before the reader is refer to references. (Bowman, 2000; Akiva, 2003, 1996; Kanafani 1983; Anas, 1979).

Linear regression analysis was performed to determine the factors that influence the decision making of physical movement.

$$Y = C + bx1 + bx2 + \ldots + bn$$

To determine the factors that influence the decision to perform a physical encounter with a linear regression analysis the dependent variable was the frequency of face to face meetings and the independent variable is the cost factor , the availability of time , the availability of modes , the distance factor (Akiva, 2003, 1996; Kanafani, 1983; Anas, 1979) and benefit factors (Bowman, 2000) of a face to face meeting .

1. Frequency of face to face meeting (Y) is the number of meetings attended by the respondents (community members) within a certain time frame. The more number of face to face meetings, higher the score for the answers of the respondents.

2. The cost factor (x1) is an assessment of the importance of the cost to perform a face to face meeting. If the more expensive the cost to attend a face to face meeting of the less amount of physical encounter happened. The more important cost factor is considered to be a major

consideration and the higher scoring of responses.

3. The availability of time (x2) is an assessment of the importance of time as a consideration to attend a face to face meeting. If the more time the respondents, the higher attendance at face to face meetings. Increasingly considered important the availability of time, higher the score for the answers of the respondents.

4. Factors availability mode (x3) is an assessment of the importance of the availability of the vehicle to attend a face to face meeting. If there is availability of the vehicle than the respondent tends to attend the face to face meeting. If the more importance of availability vehicles for respondents, the higher score.

5. Assessment of the distance factor (x4) is the consideration of physical distance in attending meetings. If distance is an important factor in the consideration of the physical attend the farther distance the face to face meeting location respondents tend to be absent more important consideration of the distance, the higher the score for the answers of the respondents.

6. Factors benefits (x5) is the assessment of the benefits of face to face meeting considerations. If the more importance of the benefits of the meeting, the higher score.

On movement patterns asked the frequency of meetings, the location and mode are used to determine the implications for inclusive transportation policy.

III. RESULT

A. Characteristics of Women Online Community

KEBs members consist of hundreds women bloggers from various Indonesian blogger community, both residing at home and abroad. This community was founded by Mira Sahid on January 18, 2012. Activities undertaken include community is sharing the inspiration, information, motivation and the work of its members. This community is also frequently met offline blogger community. Besides these community activities may also be the launch of a company's products and facilitate the offer of cooperation from various parties. Community members are women with the youngest 19 years old and the oldest 45 years with professional members range from housewives (53 %) , private sector employees (32 %) , self-employed (5 %) , school / college students (7 %) and the rest is not working /looking for work (3 %).

KIH is a group that discusses about pregnancy and parenting, seminars, and product sales. This

community was founded in 2011 and has 196 active members of the 849 members. Community members are women between the ages of 19 and 35 years with a variety of professions ranging from housewives (60 %), private sector employees (38 %), and the rest is not working / looking for work (2 %).

Membership is both an online community of women began with the advent of the internet community. At first initiated by individuals and small groups who do not know each other that evolved and grew its members have access to this community portal. The member of this community spread across cities and towns in Indonesia. Most of these are located in the metropolitan city such as Jakarta (35 %) and middle cities such as Bandung (18 %) , Semarang (8 %) , Yogyakarta (12 %) , Surabaya (18 %) , Medan (2 %) and Makassar (2 %) . A small part (1-2%) of members scattered in small cities such as Ciamis, Kuningan, Lampung, Tulungagung, Balikpapan, Tarakan, Jambi, Padang and Nabire (Papua). This suggests that the relationship is not affected community social distance and geographical location. Social relationship to the community is more common interests and needs of its members so that the relations are flexible and not hierarchical (Francois, 2009) . This is evident from the distribution locations and diverse community members of extending the process.

Both communities have members who are active in their communities. This is reflected in the frequency / frequency levels to access the members of its online community. Most of its members every day (72 % and 84 % for KEB to KIH) actively accessing its online community in the form of a question and answer / find information. Only a few are not active (not necessarily once a week) to take advantage of this online community (6 % each for both communities). Other activities undertaken this community is socialization and sales of products, especially in KIH.

B. Fulfilled of Women Online Communities

One of the goals of women become members of a community is to meet the needs of women. In this case the information needs become the greatest needs are derived from an online community of women. Information about the activities of women that are embodied in the blog is the main activity for KEB. As for KIH information about pregnancy, physicians, and parenting is an example of the type of information required. However, not all needs can be met in an online community of women. Of the two members of the women's community were only met most of the needs. This means that there is a feeling that has been fulfilled, but there is an unmet state even in only a small part as can be seen in Table 1.

Table 1. Women's Online Commmunity Fullfillment

	KEB in percent	KIH in percent
Fulfilled	6	12
Almost filled	58	73
Little filled	31	12
Not filled	5	3

Noted: KEB is Komunitas Emak Emak Blogger and KIH is Komunitas Ibu Hamil

Of the full fill of which the majority are met then push the second member of this community for meeting the terms of their face to face meeting. Who feel the need for a face to face meeting as shown in Table 2. This shows that not all needs can be met through an online community.

Table 2. The Need of Face to Face Meeting

	KEB in percent	KIH in percent
Absolutely need	30	57
Need	54	43
No need	16	0

Noted: KEB is Komunitas Emak Emak Blogger and KIH is Komunitas Ibu Hamil

From Table 2 it can be shown that belief in information and communication technology reduces the face to face meeting (Cairncross, 1997) is not proven for these two communities. Community members still require a face to face meeting to follow up on communications in an online community of women. Even the phenomenon of women's online community shows that information and communication technology will lead to further requirements that although face to face meeting the information needs of the online community has been largely fulfilled.

C. Affecting Factors of the Face to face Meeting

Based on the results of the linear regression, the most influential factor in KEB is the benefit factor. With the largest coefficient (0.870) it can be concluded that the benefits of being a major consideration factor in attending a face to face meeting. The other factor is the distance factor (-0.308) , cost factors (- 0.080) , the time factor (-0.032) , the availability of modes (- 0.132) on the trust model of R^2 0.865.

At KIH turns out that the most influential factor is the benefit factor. With the largest coefficient (0.597) it can be concluded that the benefits of being a major consideration factor in attending a face to face meeting. The other factor is the

distance factor (-0.292) , the cost factor (-0.326) , the time factor (- 0.110), the availability of modes (0.339) on the trust model of R^2 0.652.

These results explained that the decision taken in an online community of women is not solely influenced by considerations that are positivistic such as distance, and cost (Akiva, 1997; Anas, 1979). Decisions will be made in an online community of women prefer the benefits gained self-actualization. In other words, the psychological factors into consideration more self-actualization (Maslow in Williams, 1995).

D. Flow Patterns

a. Flow Type

Face to face meeting of both communities was done in order to follow up on meeting the needs of the members. KEB face to face meeting is located in the hometown of its members such as Jakarta , Bandung , Semarang , Yogyakarta , Surabaya , Medan , Makassar , Ciamis, Kuningan , Lampung , Tarakan , Jambi and Padang. The face to face meeting of KIH is also located in the hometown of its members such as Jakarta , Bandung , Semarang , Yogyakarta , Surabaya , Medan , Makassar , Tulungagung , Balikpapan , Tarakan and Nabire. It is shown that the movement is locally. This suggests that activity in the online community of women is to add movement. This movement is the movement of additional local. Inclusive of transportation in this case indicates that the transport demand is local.

b. Frequency

As a continuation of the full fill of the needs of the online community of women feel the need to do a face to face meeting. Face to face meetings are conducted and attended by a various frequency. At KEB the frequency is weekley (56 %). Some of them is monthly (26%) and the rest is annual (18%). At KIH is different, which is most of the members attending face to face meetings weekly (48%) and a small percentage shown a annual (25%) and monthly (27%) face to face meeting. With the frequency of data, movement can be said to be due to a face to face meeting is a monthly even. From the data frequency of meetings attended, it can be seen that the movement pattern generated weekly and monthly. This suggests that additional patterned movement caused only weekly and monthly. In this case the transport inclusive indicates that the demand movements that occur are weekly and monthly.

c. The Used of Mode

The KEB often use motorcycles (43 %) . Some of them use a car (28 %) and public transport (26 %). In KIH is not much different, which is mostly used motorcycles (40 %) and cars (37 %) and a small proportion using public transport (17 %).

Data above explains that women use more of a personal vehicle in performing physical movements to meeting her online community. It showed that additional movement that occurs as a result of activity in the online community of women was using private vehicles. This is because women are more like private than public transport vehicles. In inclusive of transportation presents a challenge for the organization of public transport attractive to women.

IV. DISCUSSION

Based on the result described in the previous section, the chart showing the phenomenon of woman online communities can be proposed as seen in Figure 2. In this figure, the formation of new community can be observed.

It can be also observed that in women online community in Indonesia the needs of women with respect to the information are facilitated by the advances in information and communication technology.

The online community has paved the women's physical boundaries and hierarchical social relations. Thus it leads to be more flexible and geographically dispersed.
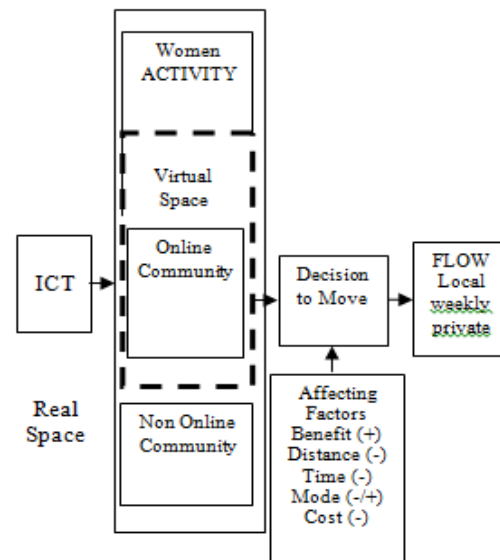

Figure 2: Affecting Factors of Women Online Communities Movement Decision

In the activity system by Manheim this research focused in women activity. Facilitated by Information and Communication Technology (ICT), the women activity could be seen as two spaces according the place. The activity developed the online and non-online community. The online community was known as e-neighborhood (Hampton, 2007). In online community, women

fulfilled they need in chat forum. In the idea of "the death of distance" (Cairncross, 1997) the fulfilled of need could reduce the trip. In the case of Indonesian Women Online Community, the Cairncross idea was not proven. Although most of the members need could be met in the forum, it is still necessary to meet physically. The face to face meeting produced trip. In the Indonesian women online community case the ICT impact was trip complement (Mokhtarian, 2002; 2000).

In deciding to make face to face meeting the factors which are often considered is the benefit, cost, time, distance, and the available modes. Of the five factors, the main factor to be a factor considered by most women online community is benefit factor. The trip of Indonesian women online community was created by the benefit of the face to face meeting. The more benefit face to face meeting than the more high women tend to attend the meeting. From the regression linear output it shown that the distance was not the important thing for decision to attend the face to face meeting. It showed by the negative in coefficient. It is different with the trip based approach that the distance usually placed as traffic impedance (Morlok, 1997; Kanafani 1983). The available of time was not the important factor in Indonesian women online community to decide had face to face meeting. The mode of vehicle was different in both group which important in KIH but not important in KEB. From a face to face meeting the movement patterns generated local, annual and the used modes are motorcycles and cars. This phenomenon completed the activity system by Manheim especially in the space that activity happened. The rise of mobility by women online community activity has brought the demand of trip in transportation system. It has brought the need of women in the inclusive transportation especially in vehicle they used.

V. CONCLUSION

In this study, Manheim's concept has completed by the type of space not only real space but also in virtual space. Progress and ease of ICT has made an online community of women in Indonesia, the formation of new communities that paved the physical boundaries and hierarchical social relations become more flexible and geographically dispersed. However, although the most of members have met the needs of the online community, there is still a need to meet physically. The main factor that influences the decision to perform a face to face meeting is the benefits of the meeting itself. Movement patterns that happen to be local, weekly and used mode are motorbikes and cars.

The inclusiveness of the women community in Indonesia by ICT has completed of weekly traffic. It indicated the need of public transport policy in toward inclusive women transportation facilities that accommodate pregnant women such as public transport and transit facilities.

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