Counselove: Marital Counseling Android-Based Application to Promote Marital Satisfaction

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ABSTRACT

This paper presents the development of Android-based framework for improving marital satisfaction. Classic research in psychology found that stability of marriage is based on the ability to create and maintain a positive interaction ratio five times more than negative interactions. Based on that, we present Counselove, a mobile application intended to record information of daily positive behaviors (joking, showing affection) of couples who use the application. We propose a method where the apps can determine users’ marital satisfaction level and also can help users increasing their marital satisfaction based on the relationship satisfaction questionnaire and the assessment of user’s self reported behaviors to their partners using fuzzy logic. The experimental results shown the application is running well on mobile devices based on Android platform. Lastly, we provide result of in depth interview with two users. Further research and development of the Counselove apps are discussed.

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1. INTRODUCTION

Divorce rate throughout the world is increasing. In Europe, the divorce rate from 1965 is 0.8 from 1000 person and increased to 2 from 1000 person in 2012. While in America, it increases from 2.7 in 2009 to 2.8 in 2012. Similar trend occur in Asia, from 2.5 in 2009 to 2.7 in 2011. Especially in Indonesia, the divorce rate increase 23.9% percent, from 223,371 cases in 2009 to 276,791 cases in 2011 [1]. This number showed that keeping marriage is getting more difficult from time to time.

Vulnerability-Stress-Adaptation model of marriage posit that marriage stability is affected by couple’s external stress, adaptation process, and marital satisfaction [2]. In order to keep marriage stability, couple should activate skills needed for adaptation to increase marital satisfaction and prevent more serious problem such as divorce. Marital satisfaction can be defined as a result of greater perceived benefits of marriage [3]. From multi-dimensional perspective, marital satisfaction include general evaluation of marriage from extremely satisfied to dissatisfied and also evaluation of more specific areas in marriage such as personality issues, communication, conflict resolution, financial management, leisure activities, sexual relationship, children and parenting, family and friends, equalitarian roles, and religious orientation [4].

There are several evidence based marriage enrichment program to help couple increase marital satisfaction, such as PREP-ENRICH [5], PAIRS [6], Hope focused Marital Enrichment [7], PREP, Relationship Enhancement, Couple Communication Program [8]. All the program require couple to meet counselor. Having to enroll to those programs require efforts in terms of time and money. On the other hand, according to ILO’s report, there are increasing number of woman who work freelance and decreasing of
unemployed women in 2013, compared to 2009 in Indonesia [9] resulting in more dual career marriage. This implied they have little time to spend together, let alone going to marriage enrichment program. On the other hand, 40% young people age 25-34 years old, including husband and wife use android smartphone [10]. Therefore, there are opportunities to use smartphone apps to help build marital satisfaction.

Mobile application has been used to promote behavioral healthcare [11], integrated with clinical practice [12] and also promote wellbeing [13]. According to ABI research, 9 billion apps were downloaded worldwide to mobile phone in 2010. In 2011, there were roughly 17,000 health-related applications for iPhones, Android based devices, and other mobile phones and tablets. [12] According to Statista.com, as of May 2014, there are 33,900 apps worldwide dedicated to health and fitness for the Android operating system. [14] This showed that the digital health industry has grown significantly. According to unified theory of acceptance and use of technology (UTAUT), one of the consumer technology use is to facilitate condition, refer to consumer’s perceptions of the resources and support available to perform a behavior [15]. There are several mobile apps that provide information, activities and support to enhance romantic relationship [16]. These applications has features to promote communication [17], sharing moments, enhancing intimacy, even filling couple’s “love tank” in a fun way [18]. Some of this application is developed by well experienced marital counselor such as John Gottman [18]. Table 1 describes several apps that aim to promote romantic relationship.

| No | Apps      | Description                                                                 | Platform     |
|----|-----------|------------------------------------------------------------------------------|--------------|
| 1  | Avocado   | Messaging, share photos, to do list, calendar.                              | Android & IOS|
| 2  | Couple    | Messaging, share photos, calendar, sketches, thumbkisses, share location.   | Android & IOS|
| 3  | Pillowtalk| Email creative playtime ideas for couples                                   | Android & IOS|
| 4  | Loving - Couple Essential | Messaging (text, voice), share photos, menstrual calendar. | Android & IOS|
| 5  | Kindu     | Match sexual related activity.                                              | Android & IOS|
| 6  | Twyxt     | Messenger, share photos, calendar.                                          | Android & IOS|
| 7  | Between   | Messaging (text, voice), share photos, calendar.                            | Android & IOS|
| 8  | Love Maps | Questions idea for conversation.                                            | Android & IOS|
| 9  | Kahnoodle | Game play, rewards for loving interactions.                                 | Android & IOS|
| 10 | Couplete  | Messaging, share photos, love letters, relationship story, calendar, to do list, activity ideas. | Android |
| 11 | Koupky    | Game play, rewards for loving interactions.                                 | IOS          |
| 12 | Goodforapp| Craft personalized coupons.                                                 | IOS          |

Those applications emphasizing private communication, and content sharing. None of them include psychological assessment of marital satisfaction. Also, none of them specifically use research finding form Gottman and Levenson [20]. Classic research from Gottman and Levenson [20] found that stability of the marriage is based on the ability to create and maintain a positive interaction ratio 5 times more than negative interactions. Furthermore, Gottman and Driver [21] found that the couple could feel the satisfaction of their marriage in simple way, which is through some moments/things that generally considered unimportant, such as joking and showing affection. These simple moments are very important for the healthy and stability of marital relationship. It can strengthen the intimacy of couple and become a strong foundation in marriage. By having a strong foundation, then the couple can be more prudent in dealing with problems. Based on that, we interested to develop the system to increase marriage satisfactions based on positive interactions from couples.

2. RESEARCH METHOD
2.1. Architecture of System
Android is an open source and Linux-based Operating System for mobile devices such as smart phones and tablet computers. Android was developed by the Open Handset Alliance, led by Google, and other companies. Android offers a unified approach to application development for mobile devices which means developers need only develop for Android, and their applications should be able to run on different devices powered by Android. Android operating system is a stack of software components which is roughly divided into five sections and four main layers as shown below in the architecture diagram [22]. Figure 1 shows android architecture diagram.
At the bottom of the layers is Linux - Linux 2.6 with approximately 115 patches. This provides basic system functionality like process management, memory management, device management like camera, keypad, display etc. This system provides a survey for user to obtain their level of marriage satisfaction. Then the system explains the user about their marriage condition, also provides some advices and motivations to the user. If user agree to continue using this system, then the system gives them some tasks, articles in order to increasing their marriage satisfaction. In addition, the system ask user to fill their interaction with their partner everyday in order to recognize how well their marriage interaction. In few days, the system will provide a survey again to compare their first score and their new score in order to recognize that their level of marriage satisfaction is increasing, decreasing, or not changing. Data of user in securely save to web service using PHP and MySql. We develop an interactive application based on Java Platform [23-24]. Figure 2 below is a communication model based on web services that shows architecture of our application for marriage satisfaction. We design a user interface where user can make activities in this system such as Take the Survey, Fill Activity, Add New Activity, Complete the Task, Read the Article and Turn on/off the Sound. We design a use case diagram based on Whitten [25]. Figure below is a use case diagram from our application called Counselove that consists of Take the survey, Fill Activity, Add New Activity, Complete the Task, Read the Article and Turn on/off the Sound as shown in Figure 2:

2.2. Design of Fuzzy Logic for the System

The fuzzy logic algorithm is an artificial intelligence algorithm that uses mathematical logic to solve to by the data value inputs which are not precise in order to reach an accurate conclusion, and has been used...
widely for decision making such as [31]. A fuzzy logic approach is used to construct the marriage satisfaction model. As describe in our previous paper [30], we can measure how satisfied a couple in communication, balance of roles, agreement, openness, intimacy, social intimacy in relationships, sexuality, financial, spirituals shown in Figure 3 to 9, to make a measurement the quality of their marriage satisfaction:

Figure 3. Fuzzy Logic of Communication

Figure 4. Fuzzy logic of Balance of Roles

Figure 5. Fuzzy logic of Openness

Figure 6. Fuzzy logic of Intimacy

Figure 7. Fuzzy logic of Social Intimacy in Relationships

Figure 8. Fuzzy logic of Sexuality

Figure 9. Fuzzy logic of Financial
Based on the fuzzy logic, we create 10 rules to determine how satisfied a couple with their marriage. These are some examples of the rules:

If **communication** “very satisfied” and **balance of roles** “very satisfied” and **agreement** “very satisfied” and **openness** “very satisfied” and **intimacy** “very satisfied” and **social intimacy in relationships** “very satisfied” and **sexuality** “very satisfied” and **financial** “very satisfied” and **spiritual** “very satisfied” then **marriage satisfaction** is “very satisfied”

If **communication** “quite satisfied” and **balance of roles** “quite satisfied” and **agreement** “quite satisfied” and **openness** “quite satisfied” and **intimacy** “quite satisfied” and **social intimacy in relationships** “quite satisfied” and **sexuality** “quite satisfied” and **financial** “quite satisfied” and **spiritual** “quite satisfied” then **marriage satisfaction** is “quite satisfied”

If **communication** “unsatisfied” and **balance of roles** “unsatisfied” and **agreement** “unsatisfied” and **openness** “unsatisfied” and **intimacy** “unsatisfied” and **social intimacy in relationships** “unsatisfied” and **sexuality** “unsatisfied” and **financial** “unsatisfied” and **spiritual** “unsatisfied” then **marriage satisfaction** is “unsatisfied”.

2.3. Getting the Level of Marriage Satisfaction

Based on Karney [2], marital satisfaction is an evaluation of the relationship depends on the good or bad of adaptive processes in the couple, which is influenced by the enduring vulnerabilities and stressful events as shown in Figure 10:

![Vulnerability-Stress-Adaptation Model of Marriage](image)

Based on concept in figure 10, our system provides user a survey in order to get their level of marriage satisfaction. This survey is constructed for couples in Indonesia, especially urban area such as Jakarta. It is constructed based on the dimensions of the three marital satisfaction measurement, namely Dyadic Adjustment Scale [26], ENRICH marital satisfaction [4], and Marriage Satisfaction Questionnaire [27]. Researchers make some adjustments to the conditions of young adults aged couples that live in urban areas by interviewing four couples working in Jakarta. Interviews showed there were 9 dimensions in urban couples marital satisfaction. The questionnaire consists of 38 questions, which are divided to 9 dimensions [28].

- Communication (4 items)
- Balance of Roles (6 items)
- Agreement (4 items)
- Openness (3 items)
- Intimacy (4 items)
- Social Intimacy in Relationships (4 items)
- Sexuality (4 items)
- Financial (4 items)
- Spiritual (5 items)

These dimensions are used to get where are the weaknesses and the strengths in the user’s relationship with their partner. By knowing it, the system can give the appropriate advices and motivations to user. There are 4 options to answer each question, which are “very satisfied” is 4 and “satisfied”, its value
is 3; “dissatisfied” is 2 and “very dissatisfied”, its value is 1. Associated with given multiple choice answers for each question, so it can be summed the max and min score for each dimension:

| Dimension                | The Number of Questions | Min Score | Max Score |
|--------------------------|-------------------------|-----------|-----------|
| Communication            | 4                       | 4         | 16        |
| Balance of Roles         | 6                       | 6         | 24        |
| Agreement                | 4                       | 4         | 16        |
| Openness                 | 3                       | 3         | 12        |
| Intimacy                 | 4                       | 4         | 16        |
| Social Intimacy in Relationships | 4                  | 4         | 16        |
| Sexuality                | 4                       | 4         | 16        |
| Financial                | 4                       | 4         | 16        |
| Spiritual                | 5                       | 5         | 20        |

Then each value is summed, so the system will knowing is the user satisfied with his/her marriage or dissatisfied by total value from the survey. From the value, system will know, in which area the couple is satisfied the most and which they are less satisfied.

2.4. Increasing Marriage Satisfaction

Gottman and Driver [21] found that couples can feel the satisfaction of the marriage relationship through the simple expedient of the case / small moments that are generally not considered important, such as a joke or show affection. Simple moments like this are very important to the health and stability of marital relations. These moments can strengthen the intimacy couples, and became a strong foundation in a marriage relationship. By having a strong foundation, it can be a better partner in the face of conflict. Therefore in this system is provided “Fill Activity” module, which is used to input user’s activity (interaction) that they have done with their partner. Then the system recognizes whether the interaction is negative or positive. After that, the system calculates the ratio of the activities that user have filled. Is the ratio is 5 : 1 (positive : negative), or lower, or higher. If the ratio is lower than 5 : 1, then the system will give a warning to user, and give some tasks in order to increasing the ratio. The ratio 5 : 1 is equal to $5/6 \times 100\% = 83.3\%$, so the IF-THEN RULES are:

\[
\text{IF } \left( \frac{\text{"positive activity"}}{\text{"total activity"}} \times 100 \right) \text{ is less than } 83.3\% \text{ THEN give the warning}
\]

Aside from the warning, the apps also provide task that can increase positive behavior. Those tasks are simple task such as: smiling to your partner, tell a neutral joke to your partner, tell a happy experience to your partner, respond to your partner’s story, say “thank you” and other simple daily activities.

3. RESULTS AND ANALYSIS

Experiments of this system have been tested for getting level of marriage satisfaction of a person. Based on the experiment, the system runs very well with the capability to calculate the total value in the survey as shown in Figure 11. This application can be download at Google Play [29]. We also have questioners to testing this application to young couples in Jakarta with about 100 respondents between 20-40 years old.
In the first stage, user registered by filling out one form consisting of name, gender, user age, the age of the couple, marriage age, the age of children (if any), the last user education, occupation, and address. Then on the next stage, contained user’s agreement and Terms and Conditions of the applications. The administration web (www.counselove-pernikahan.com) shown in Figure 12 and 13.

Figure 11. Result of simulation using Sony Xperia L (4.2.2 Jellybean), Splashscreen (a), welcome page for starting or exit from application (b), Personal Data form for the questionnaire (survey) (c), page of the questionnaire (d) main page for choosing fill activity, complete task, and read article (e) [29]

Figure 12. Information of user and their activities
Through the interface back-end system, the results of the questionnaire will be validated and represented in a diagram. User will be given the results of the analysis level of marital satisfaction results, as well as the advantages and lack of activities and tasks that can be performed by the user on a daily basis. After testing phase, we invite two female respondents, age 22 and 24 who are marriage for 1-2 years with one children age 1 and 2 years old to try Counselove. After that, we ask them about their experience in using Counselove and whether they will use it daily. We also ask what positive and negative features from Counselove are. Lastly, we asked for suggestions to make the apps more functional. Both interview respondents think that the activity suggestions are useful as reference of daily activity with their spouse. Therefore, they will use it daily and will recommend it to their husband. The downside of this apps is the self-report mode, one of the respondent think that user can fake the daily activity in order to gain more score. Respondents also thinks that they may have no time to input the daily activity because now they are busy nurturing their toddler and doing household chores. One of the respondent suggest to add features regarding child rearing and family activities that includes husband, wife, and their child.

4. CONCLUSION
We successfully develop Android-Based application for increasing marriage satisfaction in Bahasa Indonesia for young married couple. This application can help users to determine the level of household harmony in their way that is easy, interactive, and interesting. This application can provide motivation and advice to the user in the life of the household. Based on the questioners, this application is really useful and interesting. Although, based on description of other apps for couple, there are some features that can be add to this apps. Those features are private messaging, shared content (photos, to do list, calendar), and content related child rearing. Further research can explore the efficacy of this apps in terms of promoting marital satisfaction in dual career couple who live in urban area, such as Jakarta, Indonesia by conducting randomized control trial experiment.

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Counselove: Marital Counseling Android-Based Application to Promote Marital Satisfaction (Widodo B.)
