

Need Analysis And System Engineering Of Financial Planning Web-Based Application Development For Indigenous Communities At Village Credit Institution In Badung Regency, Bali

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Abstract—This research aims to develop Financial Web-based application For Indigenous Village Communities at Village Credit Institution in Badung Regency, the Province of Bali, Indonesia. This paper focuses on discussing the initial stages of the research namely investigating awareness and financial literacy of village communities, need analysis and system engineering of the application. In this study, the population is all of 122 LPDs in Badung Regency, the Province of Bali that are located in six districts namely Petang, Abiansemal, Mengwi, Kuta Utara, Kuta, and Kuta Selatan. Samples were taken using cluster method by taking four districts. Furthermore, from each chosen district were taken 12 customers (member of indigenous communities) as respondents. The results of the research showed that: (1) Financial planning awareness of Badung Regency indigenous village community are good because average score of all aspects were greater than 3.0 as well as average of financial planning products owned was more than one. Their financial literacy are also good due to average score and majority of aspects were greater than 2.50. (2) The need of Badung Regency indigenous village communities for web-based financial planning are strong as can be seen from the average score of 3.35. Their purpose of financial planning are mostly for education cost, old age/pension, and traditional/religious ceremony cost (3) System engineering of Financial Planning Web-based Application includes input, output, and processes needed by the application as well as structure, system architecture, databases, modules and users of the application.

Keywords—*application development, financial planning, web-based, village credit institution*

I. INTRODUCTION

The welfare and happiness of the society is one of the objectives of the government programs of the central government, provincial government and regency/city government including the government of Badung Regency, Province of Bali, Indonesia. One of the factors that influence society happiness and welfare including indigenous village communities in Badung Regency, besides health and social relations is a good financial condition. Good financial conditions can be achieved by doing financial planning from an early age. To become an independent human in finance

we need to have strong motivation so that immediately make financial planning and immediately apply it [1]. One of the important things in financial planning is saving. The behaviour of families both in rural and urban areas is different in terms of saving and financial planning. There is a tendency of individuals to save gets higher when financial literacy is high and decreases with increasing age [2]. Savings activities are an important part of financial planning which is likely to lead to a good economic situation in retirement. The economic situation was one of the predictors of happiness from retirees especially on rural and urban communities in Brazil [3]. Meanwhile, there was relationship between retirement savings is correlated with financial literacy, especially in the population studied, namely members of LinkedIn social media [4]. Financial literacy of community was vary according to demography and economy, especially in India [5]. Financial planning requires financial literacy especially for indigenous communities. Therefore, financial literacy education or FLE for the community is very important in the 21st century. According to Blue [6], a practical approach is better in FLE implementation to the community rather than individually. There were five domains of financial literacy namely 1) Knowledge of financial concepts 2) Ability to communicate about financial concepts 3) Ability to manage personal finance 4) Ability to make financial decisions 5) Confidence to make future financial planning [7]. Good financial literacy of community may leads to the wealth [8].

Many research concerning financial planning development models are carried out, such as by [9] which include financial management, emergency funds and insurance, medium and long-term investments, and other long-term issues. Pension preparation also includes long-term programs. The main factors consumers prepare for retirement savings by using the services of a financial planner or accounting are self-ability and attitude [10].

In Bali, people also need funding for religious ceremonial costs, primary needs, education, and health costs beside retire expenses. To meet their needs in the future, they should prepare financial planning. Potential financial

institutions that can provide financial planning services for indigenous peoples in Bali, especially in Badung Regency are Village Credit Institutions or *Lembaga Perkreditan Desa* (LPD) in their respective indigenous villages. Village Credit Institutions (LPDs) are a financial institution with two unique characteristics: (a) As an institution owned by an indigenous village (Pakraman Village) fully supports Balinese culture; (b) Unlike other financial institutions, the LPD is quite inclusive and covers all indigenous villages in Bali [11]. The LPD supports indigenous villages in implementing the local wisdom of the Balinese people, namely Tri Hita Karana, which is a harmonious relationship with God, with other peoples, and with environment. LPDs tend to have good financial performance if they carry out a culture of harmony in accordance with the Tri Hita Karana concept [12]. [13] concluded that the LPD is a model of financial institutions developed based on the values of indigenous people living in the community in order to help the economy of the Balinese people. LPD has a role to improve the welfare of the community through economic development of the community, become a source of income for indigenous villages in Bali (Pakraman Village), increase the potential of indigenous village communities and help members and reduce their burden to live in the community. Recently, LDP is faced with competition from other financial institutions. Research by [14] concludes that the strengths and weaknesses of the LPD are that the working area is limited to the indigenous village where it is located as regulated (*awig-awig*). In facing increasingly fierce competition, especially in the era of the ASEAN Economic Community (AEC), LPDs have their own place in economic development and traditional structures in Balinese society, so that big challenges can be transformed into opportunities by diversifying products including collecting fund products. In general, the sources of LPD funding are very limited compared to the funds needed by the village community. Therefore, besides the funding from Regional Development Banks (BPD), the LPD also carries out public funds in form of savings programs such as deposits and savings. This savings program indirectly also aims to provide education and awareness about the importance of financial planning. By doing good financial planning, the money can be used in the future. For people who live in Badung Regency, they have a more complete and varied financial planning program with a computer-based application.

In conducting diversification, the product offered by the LPD must be a website-based application to be easily accessible to indigenous peoples. The web has a significant impact on all aspects of our society [15]. As the use of the web increases, people's dependence on web applications is increasingly important. Therefore, this research entitled "Development of Web-Based Financial Planning Applications for Indigenous Village Communities at Village Credit Institutions in Badung Regency, Bali" may help indigenous peoples to plan their finance. This paper are focuss to the initial stages of the research .

Based on the background above, then issue of concerns in this paper are: (a) How do financial planning literacy and awareness of Badung Regency indigenous communities? (b) How do need analysis results of Financial Planning Web-based Application For Indigenous Community at Financial Credit Institution in Badung Regency? (c) How do system engineering of Financial Planning Web-based Application For Indigenous Communities at Financial Credit Institution

in Badung Regency? The purpose of this research are: (a) To know the financial planning literacy and awareness of Badung Regency Indigenous Village Communities, and (b) To Know need analysis results of Financial Planning Web-based Application Development For Indigenous Village Communities at Financial Credit Institution in Badung Regency. (c) To Know system engineering of of Financial Planning Web-based Application Development For Indigenous Village Communities at Financial Credit Institution in Badung Regency.

II. RESEARCH METHODOLOGY

This research was conducted to develop Financial Planning Web-Based Application For Indigenous Community at Financial Credit Institution in Badung Regency, the Province of Bali, Indonesia involving six steps conducted in multiyears that refer to *System Development Life Circle* (SDLC) method as described by Pressman [16]. The six steps are: (1) *system engineering*, (2) *analysis*, (3) *design*, (4) *coding*, (5) *testing*, and (6) *maintenance*. In the first year, this research focuss to conduct analysis and system engineering with the following steps: a) survey on community literacy dan need analysis, b) identification on information need by LPDs concerning with financial planning. In this study, the population was all LPDs in Badung Regency, the Province of Bali. The population consist of 122 LPDs that are located in six districts namely Petang, Abinsemal, Mengwi, Kuta Utara, Kuta, and Kuta Selatan. Samples were taken using cluster method by taking four districts. Furthermore, from each chosen district were taken 12 customers (member of indigenous village community) as respondents. So total number of sample were 48 peoples to whom data are gathered using questionnaire. Data were also gathered from LPDs manager. Data was processed using description statistics. From the processing of community data, conclusions will be obtained regarding financial planning literacy and awareness, as well as need analysis results. Furthermore, information gathered from LPDs managers as the basis of system engineering of Financial Planning Web-based Application For Indigenous Community at Financial Credit Institution in Badung Regency.

III. RESULTS AND DISCUSSION

3.1 Results

In this research, the survey was conducted at four indigenous villages at Badung Regency, Bali Province. The responden were customer and manager of village credit institution or *Lembaga Perkreditan Desa* (LPD) which belong to the indigenous village. There were 48 people as respondents consist of 12 people each village.

The results regarding to the financial planning awareness of Badung Regency indigenous Communities are described in Table 1 to Table 3.

Table 1. The Need For Financial Planning

LPD	ni	SA=4	A=3	QA=2	LA=1	NA=0
LPD Legian	12	8	4	0	0	0
LPD Sibang Kaja	12	11	1	0	0	0
LPD Kerobokan	12	3	9	0	0	0
LPD Jimbaran	12	9	3	0	0	0
Total	48	31	17	0	0	0
Average Score		3.65				

Note. SA=Strongly Agree, A=Agree, QA=Quite Agree, LA=Less Agree, and NA=Not Agree

Table 2. Interested In Financial Planning Products

LPD	ni	SA=4	A=3	QA=2	LA=1	NA=0
LPD Legian	12	2	10	0	0	0
LPD Sibang Kaja	12	8	3	1	0	0
LPD Kerobokan	12	2	10	0	0	0
LPD Jimbaran	12	6	3	3	0	0
Total	48	18	26	4	0	0
Average Score		3.29				

Table 3. Number of Financial Planning Products Owned

LPD	ni	4	3	2	1	0
LPD Legian	12	3	1	5	3	0
LPD Sibang Kaja	12	2	1	3	3	3
LPD Kerobokan	12	0	0	2	7	3
LPD Jimbaran	12	1	2	2	7	0
Total	48	6	4	12	20	6
Percentage		12.5%	8.3%	25.0%	41.7%	12.5%
Average	1.67					

From Table 1 to Table 3 can be seen that average score of Badung Indigenous Communities regarding to the need for financial planning is 3.65 out of 4.0. Their average for interested in financial planning products is 3.29 and number of financial planning products owned in average is 1.67.

The results regarding to the financial planning literacy of Badung Regency Indigenous Communities are described in Table 4a to Table 4e.

Table 4a. Understanding With Daily Savings

LPD	ni	RU=4	U=3	QU=2	DCU=1	DU=0
LPD Legian	12	2	10	0	0	0
LPD Sibang Kaja	12	11	1	0	0	0
LPD Kerobokan	12	1	8	0	2	1
LPD Jimbaran	12	10	1	1	0	0
Total	48	24	20	1	2	1
Average Score	3.33					

Note. RU=Really Understand, U= Understand, QU=Quite Understand, DCU=Don't Completely Understand, and DU=Don't Understand

Table 4b. Understanding With Deposits

LPD	ni	RU=4	U=3	QU=2	DCU=1	DU=0
LPD Legian	12	1	4	6	1	0
LPD Sibang Kaja	12	12	0	0	0	0
LPD Kerobokan	12	1	9	0	1	1
LPD Jimbaran	12	4	5	1	2	0
Total	48	18	18	7	4	1
Average Score	3.00					

Table 4c. Understanding Programmed Savings With Monthly Payment

LPD	ni	RU=4	U=3	QU=2	DCU=1	DU=0
LPD Legian	12	1	6	5	0	0
LPD Sibang Kaja	12	8	3	1	0	0
LPD Kerobokan	12	0	6	1	4	1
LPD Jimbaran	12	1	6	3	2	0
Total	48	18	18	7	4	1
Average Score	3.00					

Table 4d. Understanding Programmed Savings With Once Payment

LPD	ni	RU=4	U=3	QU=2	DCU=1	DU=0
LPD Legian	12	1	4	7	0	0
LPD Sibang Kaja	12	4	1	0	6	1
LPD Kerobokan	12	0	7	1	3	1
LPD Jimbaran	12	1	6	2	1	2
Total	48	6	18	10	10	4
Average Score	2.25					

Table 4e. Understanding The Difference Between C and D

LPD	ni	RU=4	U=3	QU=2	DCU=1	DU=0
LPD Legian	11	1	6	4	0	0
LPD Sibang Kaja	12	4	2	0	5	1
LPD Kerobokan	8	0	3	4	0	1
LPD Jimbaran	11	0	6	2	3	0
Total	42	5	17	10	8	2
Average Score	2.36					

Table 4a to Table 4e show average score of Badung Indigenous Communities regarding to the understanding with daily savings, Deposits, Programmed Savings With Monthly Payment, Programmed Savings With Once Payment, and the difference between C and D are 3.33, 3.00, 2.69, 2.25, and 2.36 respectively.

The results regarding to the need of Badung Regency Indigenous Communities for web-based financial planning are described in Table 5 to Table 6.

Table 5. The Purpose of Financial Planning

LPD	ni	The Purpose of Financial Planning							
		1	2	3	4	5	6	7	8
LPD Legian	12	5	8	5	9	3	5	4	0
LPD Sibang Kaja	12	3	11	10	11	2	2	3	0
LPD Kerobokan	12	3	8	5	3	1	7	2	1
LPD Jimbaran	12	3	7	9	8	4	9	4	1
Total	48	14	34	29	31	10	23	13	2
Percentage		29.2%	70.8%	60.4%	64.6%	20.8%	47.9%	27.1%	4.2%

Note. 1. Wedding. 2. Cost of education. 3. Old Age/Pension. 4. Traditional/Religious Ceremony. 5. Buying House. 6. Investment. 7. Holy Trip. 8. Others.

Table 6. The Need For Web-based Financial Planning

LPD	ni	SA=4	A=3	QA=2	LA=1	NA=0
LPD Legian	12	4	8	0	0	0
LPD Sibang Kaja	12	9	3	0	0	0
LPD Kerobokan	12	4	4	1	2	1
LPD Jimbaran	12	9	2	1	0	0
Total	48	26	17	2	2	1
Average Score	3.35					

Note. SA=Strongly Agree, A=Agree, QA=Quite Agree, LA=Less Agree, and NA=Not Agree

Table 7. Types of Information Needed

LPD	ni	Types of Information Needed			
		1	2	3	4
LPD Legian	12	10	6	2	1
LPD Sibang Kaja	12	12	12	10	0
LPD Kerobokan	12	9	6	9	1
LPD Jimbaran	12	10	9	10	0
Total	48	41	33	31	2
Percentage		85%	69%	65%	4%

Note. 1. Look at the types of financial financial planning programs 2. Look at simulation of the financial planning program 3. Look at the balance of the financial planning program. 4. Etc.

The response from LPD management with regard to financial planning is described in Table 8 to Tabel 10

Table 8. Type of Savings Program Available in LPD

LPD	Total	Type of Savings Program Available in LPD				
		1	2	3	4	5
LPD Legian	4	1	1	1	1	0
LPD Sibang Kaja	4	1	1	1	1	0
LPD Kerobokan	3	1	1	1	0	0
LPD Jimbaran	3	1	1	0	1	0
Grand Total	14	4	4	3	3	0
Percentage		100%	100%	75%	75%	0%

Note. 1. Daily Savings. 2. Deposits. 3. Programmed Savings With Monthly Payment. 4. Programmed Savings With Once Payment. 5 Others Savings.

Table 9. The Need of Indigenous Communities For Financial Planning According to LPD Management

LPD	Need For Financial Planning				
	VA=4	A=3	QA=2	LA=1	NA=0
LPD Legian	1	0	0	0	0
LPD Sibang Kaja	1	0	0	0	0
LPD Kerobokan	1	0	0	0	0
LPD Jimbaran	1	0	0	0	0
Total	4	0	0	0	0
Average Score	4,0				

Table 10. The Need of Indigenous Communities For Web-Based Financial Planning According to LPD Management

LPD	Need For Web-Based Financial Planning				
	SA=4	A=3	QA=2	LA=1	NA=0
LPD Legian	0	1	0	0	0
LPD Sibang Kaja	1	0	0	0	0
LPD Kerobokan	0	1	0	0	0
LPD Jimbaran	0	1	0	0	0
Total	1	3	0	0	0
Average Score	3.3				

Note. SA=Strongly Agree, A=Agree, QA=Quite Agree, LA=Less Agree, and NA=Not Agree

Among the four LPDs, LPD Sibang Kaja plan to establish Web-Based Financial Planning this year and the others will be next year. Based on the need of Badung Regency Indigenous Communities for web-based financial planning as well as the response from LPD management, then system analysis can be described as follows.

The output needed by the LPDs are LPD’s General Description of the Financial Planning Program, Simulation, and Information on the Financial Planning Program Balance. General Description of the Financial Planning Program contains information namely: product name, type of depositing money, whether every month or once at the beginning, types of withdrawal of money, whether every month or once at the end, and how to open a financial planning program account.

The Financial Planning Program simulation can be a table or a form. Simulations in tables are fixed, while simulations using forms are flexible depending on the variables used as input (independent variables) and the output (dependent variable).

Financial planning products type I is fixed deposit every month and withdrawal once at the end of the program such as the financial product SIMPEL and SUPRA in LPD Legian or SIMADEJA, TAMASDE, and TSA in LPD Sibang Kaja or SUPUTRA in LPD Kerobokan with simulation in tables that contain information namely: product name, amount of deposit each month (A), the period of deposit in year (n), the amount of money that can be withdrawn once at the end of the program (Sn). Its flexible simulation using form contains input variables are A and n while the output is Sn that calculated using amount of annuity formula.

Financial planning products type II is deposit once at the beginning and withdrawal once at the end of the program such as TAHTA in LPD Legian or TSA in LPD Sibang Kaja with simulation in tables contain information namely: product name, deposit amount at the beginning (P), term of deposit in years (t), the amount of money that can be withdrawn at the end of the program (Pt). Its flexible simulation using form contains input variables are P and t while the output is Pt that calculated using compound interest formula.

Financial planning products type III that do not available at any LPD is fixed deposit every month and withdrawals are fixed every month until the end of the program. The simulation is in tables contains information namely: product name, smount of deposit each month (A1), period of deposit in year (n1), amount that can be withdrawn every month (A2), the period of withdrawal in years (n2).

Financial planning type IV that also do not available at any LPD is deposit once at the beginning and fixed withdrawal every month until the end of the program. The simulation is in tables contains information such as: product name, the amount of deposit once at the beginning (P), period of deposit in year (n1), amount that can be withdrawn every month (A2), and he period of withdrawal in years (n2).

In producing the desired output from the input, a process is needed. To display a financial planning program simulation, the amount of interest rate/month that is applied holds a very important role whose value is determined by the LPD authority. The process of output appearance in the form of a simulation of the financial planning program with fixed payments every month (A) can be seen in Figure 1 and Figure 2.

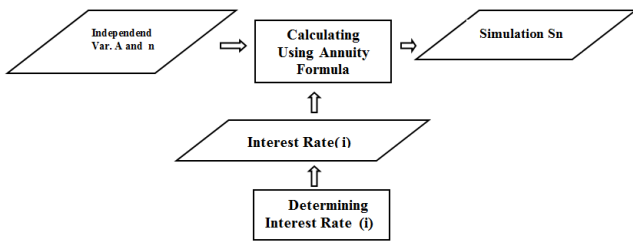


Figure 1. Output Display Process (Simulation Sn)

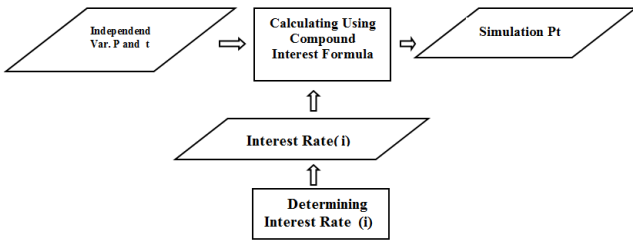


Figure 2. Output Display Process (Simulation Pt)

3.2 Discussion

The awareness to the financial planning of Badung Regency Indigenous Communities can be seen from The Need For Financial Planning with average score of 3.65 out of 4.0 (very good) and Interested In Financial Planning Products with average score of 3.29. In general, their financial planning awareness is good because average score of all aspects are greater than 3.0 as well as average of financial planning products owned is more than one (1.67). Respondents born from 1955-1976 have average of financial planning products of 1.9 compared with average of 1.5 owned by respondents born from 1977-2003 which is not in line with [2] findings that there is a tendency of individuals to save decreases with increasing age. Meanwhile, the financial literacy of Badung Regency Indigenous Communities can be seen from Understanding With: a) Daily savings, b) Deposit, c) Programmed savings with saving every month for several years and withdrawing at the end of the program d) Programmed savings with saving once at the beginning and withdrawing at the end of the program, and e) Difference between c and d. Average score of every aspects and overall aspect are described in Figure 3.

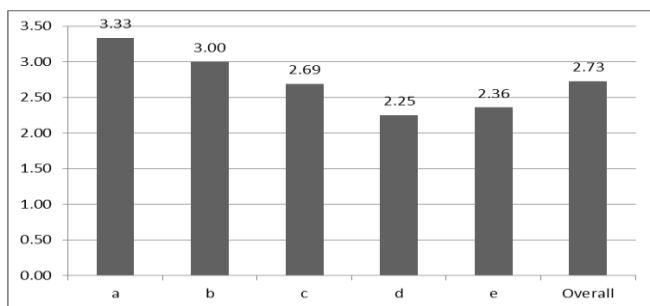


Figure 3. Average Score Of Every Aspects And Overall Aspect

As can be seen from Figure 3, the overall average score is 2.73 and majority of aspects are greater than 2.50. It means that their financial literacy is good. This facts are in line with [4] that financial literacy, precautionary savings and retirement planning are positively correlated. The respondents's financial literacy are vary among the four

districts (LPDs) which has been tested using ANOVA statistics test (p-value=2.6%) which is similar to [5].

The need for Web-based Financial Planning of Badung Regency Indigenous Communities can be seen from Table 6 is very strong with average score of 3.35 and their purpose mostly for Cost of Traditional/religious Ceremony (64.6%), and Cost of Old Age (60.4%). From the web-based application, they need to look at information about the types of financial planning programs (85%), simulation of the financial planning program (69%), and the balance of the financial planning program (65%).

Badung Regency Indigenous Communities needs for financial planning seem to be supported by the LPDs. It can be seen from the availability of financial planning program savings at many LPDs in Badung Regency including savings for religious ceremonies to support values of indigeneous people living in the community [13]. LPD Managements also think that The Need of Indigenous Communities For Web-Based Financial Planning is high with average score of 3.3. Its existence will have an impact on all aspects of society [15]. Even though it is not yet available at the LPD, however all of them plan it no later than two years.

Based on the description of inputs, outputs and the processes needed in web-based financial planning for LPDs in Badung Regency, an outline of the application structure is designed as shown in Figure 4.

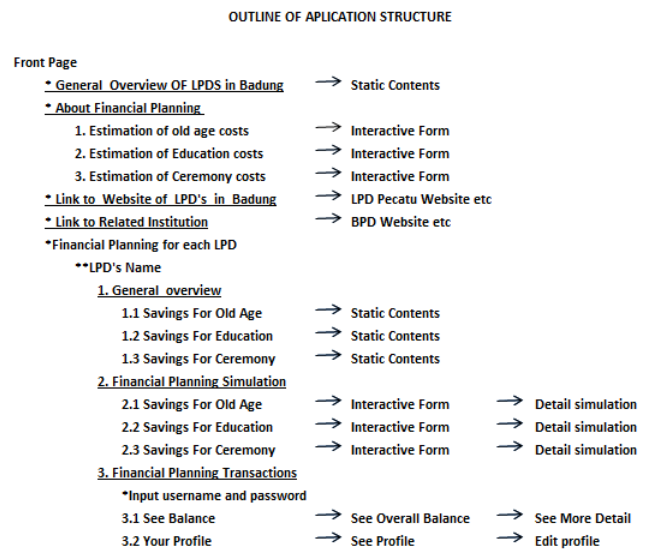


Figure 4. Outline Of Application Structure

To implement the application structure that has been created, we need the support of infrastructure, especially hardware, which is described in the system architecture as shown in Figure 5.

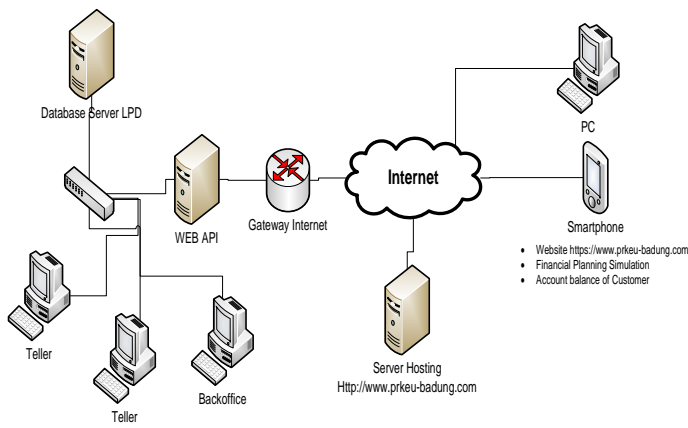


Figure 5. System Architecture

The modules needed to support the system architecture are: User Module, View Balance Module, Flexible Simulation Modules, and Detailed Simulation Module. Databases that support the moduls are: 1) Database of LPD with the name LPD consist of fields: No_LPD, Name_LPD, Adress, Phone, and Picture, 2) Database of LPD customer with the name LPDCUST consist of fields: NIC, Name_CUST, Adress, Phone, and Picture, 3) Database of Financial Planning Product with the name FPP consist of fields: No_FPP, Interest_rate, Name_FPP 4) Database of Financial Planning Account with the name FPPA consist of fields: No_ACC, No_FPP, NIC, Date_Start, Interest_rate_Acc, N1,N2, and balance.

The main user of this application will be indigenous communities in Badung Regency and LPD customers besides LPD management, as well as PLPD (The government agency that coordinates the LPD) in Badung Regency. Access rights from the community are only limited to seeing information such as general overview of LPSs in Badung Regency, about financial planning, related institutions etc. LPD customers have an access to see savings balance, LPD management has an access to update interest rate, and PLPD has an access to update information in the General Overview of LPDs in Badung Regency

IV. CONCLUSION

Based on the results achieved previously, then the conclusion can be drawn as follows: (1) Financial planning awareness of Badung Regency indigenous community are good because average score of all aspects are greater than 3.0 as well as average of financial planning products owned was more than one. Their financial literacy are also good due to average score and majority of aspects were greater than 2.50. (2) The need of Badung Regency indigenous Communities for web-based financial planning are strong as can be seen from the average score of 3.35. Their purpose of financial planning are mostly for education cost, old age/pension, and traditional/religious ceremony cost. (3) System engineering of Financial Planning Web-based Application includes input, output, and processes needed by the application as well as structure, system architecture, databases, modules and users of the application.

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