

## Collaborative Efforts by a University, Government and Agricultural Cooperatives (ACS) to Develop a Credit Facilitation Tool: Evidence from Kamwenge and Sheema Districts in Uganda



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**ABSTRACT:** Financial performance of Agricultural Cooperatives in Uganda has constrained their ability to attract financiers and thus can't extend timely and optimal credit facilities to Small Scale Farmers in Uganda despite their huge contribution to the country's GDP. This situation is attributed to constrained decision making mechanisms in Agricultural Cooperatives' credit facilitation process. This article addresses how the University collaborated with the Government and the Agricultural Cooperatives to develop a credit facilitation tool to mitigate credit facilitation decision challenges. With a collaborative perspective, the study worked with 116 agricultural cooperatives decision makers in 6 agricultural cooperatives in Kamwenge and Sheema districts in Uganda. The study confirmed that for the financial years 2018 to 2020, Agricultural Cooperatives were not able to return on assets and on equity. Equally confirmed was that the Agricultural Cooperatives' credit facilitation decision processes, undermined the involvement of technical officers, lacked structured means of recording credit data which delayed decisions on setting optimal lending rate, lending duration and lending limit. Confirmed too was limited credit tracking which was a hindrance to timely reporting. As a result, these confirmed credit facilitation decision challenges were utilized to develop a collaborative credit facilitation decision tool. Its design is presented using user case scenarios showing how the challenges were solved and an output of these scenarios was a six suited model called the Decision Enhancement Credit Facilitation Approach (DECFA). This tool once implemented by Agricultural Cooperatives will enhance the credit process thus quickening decision making in sourcing and availing credit to Small Scale Farmers. All this new knowledge created was done in the confines of a collaboration between the University, Government and the Agricultural Cooperatives

**KEY WORDS:** Collaborative efforts, University, Government, Agricultural Cooperatives, credit facilitation

### 1 INTRODUCTION

There is a serious dearth of agricultural finance to the Small Scale Farmers (SSFs) in Uganda in spite of their huge contribution to agriculture. This is due to the low risk appetite of financiers driven by challenges of land tenure, the Ugandan financial architecture amongst other factors. This isolates, SSFs to borrow from agricultural cooperatives which are comfortable with their risk appetite. However, these agricultural cooperatives are financially struggling due to constrained decision making mechanisms in their credit facilitation process. Credit facilitation for cooperatives is an understudied area in Uganda. This article, looked at how the University collaborated with the Government and the Agricultural Cooperatives to develop a credit facilitation tool to mitigate credit facilitation decision challenges. With a collaborative perspective, i investigated, how the University collaborated with the Government and ACs to develop a credit facilitation decision tool? In addressing this question, the article: confirmed that for the financial year 2018/2019 to 2019/2020, ACs were not able to return on assets and on equity. Further confirmed was that the ACs' credit facilitation decision process, undermined the involvement of technical officers, lacked structured means of recording credit data which delayed decisions and affected the setting of an optimal lending rate, lending duration and lending limit for the SSFs. Confirmed too was limited credit tracking which was a hindrance to timely reporting which affected the ability of ACs to attract attention of financial institutions for borrowing purposes. In line with a collaborative mindset, these confirmed credit facilitation decision challenges triggered the urgency of solving this crisis and thus utilizing the decision enhancement approach, these challenges were transformed into decision enhancement requirements. These supported the design of the decision enhancement credit facilitation approach for ACs. This tool once implemented would enhance the credit process thus quickening decision making in sourcing and availing credit to SSFs. All this new knowledge created was done in the confines of a collaboration between University, Government and the ACs.

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Apart from this general introduction to the article, this article also presents the literature review, the methodology used, the findings and discussions, conclusions and recommendations

### **2 LITERATURE REVIEW**

Agriculture in Uganda accounts for 24% of the GDP, and 47% of export earnings (UBOS 2010; EMF World Bank, 2019). Over 65.5% of Ugandan workers are employed in the sector, 75% of Ugandans aged between 15 and 30 years get their first job from agriculture (UN DESA, 2017). World bank, (2017) reports that 80% of the 24% GDP contribution by agriculture is generated by small scale farmers who operate sub-optimally. This sub-optimal production can be attributed to limited attention from the academia and limited financing. Limited financing has hindered the SSFs from reaching full potential and has been due to unwillingness of financiers to extend credit to SSFs due to majorly two reasons.

Firstly, SSFs don't own land which can be used as collateral for loans. Land in Uganda can be owned as customary, mailo, freehold and lease hold (Kamanyire, 2000) acquired through inheritance, purchase, donation or hire. All these don't favor SSFs as they come from marginalized backgrounds. Secondly, the Ugandan financial architecture which is comprised of four tiers (Opolot, Nampewo, Akishule, & Nyanzi, 2013). Tier 1, comprised of the central bank strictly lends to only government agencies, international organizations and commercial banks. Tier 2 comprised of 21 commercial banks and 3 credit institution banks, lends to risk-free clients and mostly they offer secured loans that small-scale farmers don't qualify for. Tier 3 comprised of micro-finance deposit taking institutions registered under the MDI Act of 2003 (Opolot, et al, 2013). This too provides credit to only their registered clients however their cost of borrowing is high given the nature of their clients which makes it unaffordable for the SSFs. Tier 4 comprised of financing NGOs, MFIs, SACCOs, community based organizations that offer micro savings and credit is unregulated, attracts limited financiers and is the only one that can lend to SSFs.

With this unique financial landscape in Uganda, the SSFs are forced to borrow from financially struggling agricultural cooperatives which are comfortable with their risk appetite (Kabuga & Batarinyebwa, 1995). Efforts by the Government of Uganda to bridge this financing crisis through the Uganda Micro-Finance Support Center (MFSC) and Agriculture Credit Facility (ACF) (NPA, 2018) have not yielded much. MFSC provides relatively cheap credit compared to commercial banks, however the process of accessing credit is difficult and loan disbursement is delayed. This negatively affects the agrarian cooperatives because credit is accessed after the agricultural season has ended. The ACF on the other hand set up by the Government of Uganda in partnership with participating financial institutions is only limited to tier 2 and 3 in 2009 (CSBAG, 2014) and in few instances can support bankable SSFs through their cooperatives that don't exist in Uganda. Given the nature of cooperatives' clientele with far reaching effects this propagates inability to attract appropriate financiers, which results into limited credit dispensed to most SSFs (Byaruhanga, 2013). This explains the current declining trends of low returns on equity, low return on asset, reduced liquidity ratio, and increased non-loan repayments in agricultural cooperatives an evidence of poor financial performance (Balikuddembe, 2018). No wonder the 49% collapse of agricultural cooperatives in Uganda.

This article documented the current performance of agricultural cooperatives kamwenge and Sheema districts in Uganda. With the intent of motivating and opening academic debate on the SSFs for further research and attention. This was done through empirically explains credit facilitation decision challenges affecting financial performance of these cooperatives and developing a credit facilitation decision tool that would assist cooperatives to enhance faster decision making in availing credit for SSFs. In line with contribution, the study was underpinned by policy expert, (Kasekende 2016) argument that addressing the SSFs financing issues requires collaboration between the government, the private sector and the university to develop risk-sharing models that can enhance bankability of SSFs through their cooperatives. The bankability of ACs is embedded in the way, they manage decisions around credit facilitation that is credit capital sourcing, credit terms and screening and credit reporting (Ogbonna, Okaro and Igwe, 2019; Ahabyoona and Lubega, 2018). It should be noted that currently credit facilitation decisions are sub-optimal because the process of seeking for affordable credit from external sources by ACs is bureaucratic, due to riskiness from agricultural ventures, which creates delays in loan acquisition. This results in the cooperatives disbursing loans late to the SSFs, due to uncertainty of possible financing availability, the SSFs never reject the credit but the ability to utilize the same to earn returns is comprised due to seasonal based farming systems. This results leads to inability to repay loans which affects the cooperatives ability to repay the loaners and the circle continue. No wonder (Thangata, 2016) notes that 49% of the cooperatives' collapse is attributed to SSFs inability to repay their loans which makes the ACs unable to service their customers' credit needs and run ACs operational expenses.

Deeper review (Roelants et al., 2015; Bijman, 2016; Yogo et al., 2016) revealed that good credit facilitation influences financial performance of ACs. However, limited information is available on the extent of influence. Yogo et al. (2016) expresses that credit facilitation decisions in ACs are vital and agile which implies the relevance of a personalized credit facilitation decision tool to support the processes. UCA (2014) too fronts that ACs in Uganda lack support not only from the private sector but from government to build capacity through purchase and use technology. This is attributed to lack of streamlined means of credit assessment i.e. collateral security evaluation, who qualifies for credit, credit analysis and credit reporting. These unanswered questions affect decision-making. Even with these challenges, there seems to be limited studies on credit facilitation decisions and financial

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performance in Kamwenge and Sheema Districts. Equally observed is scanty studies that demonstrate collaboration supported by government, agricultural cooperatives to interact with updated research from the academia. This too was a research gap, viable and of urgency. This gap was also evidenced in the theoretical review that pronounced ACs as institutions only relevant as long as they can extend services to their clients that are sufficient and timely credit and this required that optimal decisions are made during credit facilitation which call was urgent too. This paper therefore argues that in credit facilitation decision, putting together decision stakeholders to ably share timely information would be solving the decision crisis but also evidence the creation of new arrangements among the institutional spheres of government, private and the academia which fosters the condition for innovation (Etzkowitz, 2004; Etzkowitz and Leydesdorff, 2000; Etzkowitz, 2002). It's against this pretext that innovation can fill the void of improving the way these decisions are handled as it emphasizes process enhancement and this was ably supported by service oriented architecture (SOA). This was an added advantage that supported collaboration amongst the users strongly enabling relevancy of the theory to solving the theoretical gaps identified.

Amahalu and Mary-Fidelis, (2017) further presents another view of looking at credit facilitation decisions challenges through strengthening collaboration using pragmatic models that can integrate major stakeholders along the Academia given that SSFs contribute to agriculture the shaper of GDP in Uganda. The ethos behind this model is that the potential for innovation in a knowledge society lies in a significant role for the university, the private sector and government to generate new institutional and social formats for the production, transfer and application of knowledge (Champenois and Etzkowitz 2018; Soares and Podcameni 2014;). The three actors in the model are decision stakeholders in credit facilitation that is government, the authority that governs the financial system in Uganda (Kasekende, 2016). The private sector represented by ACs ,comprised of farmers privately saving and borrowing to capitalize their farm activities (Lubega, 2018) and the university, the hub for problem identification and solution development (Kibuuka, 2018).It was critically noted that an interaction amongst these decision makers wouldn't just be an innovation but a platform for knowledge creation, knowledge diffusion and knowledge absorption which are critical elements in effectiveness of innovation systems (Kibuuka, 2018). This interaction amongst the decision stakeholders can be solution to challenges that emanate from limited information sharing (Anda, 2002).

Theoretically, credit facilitation decisions were underpinned by the credit risk theory advanced by Melton in 1974. The theory was applicable to ACs since they borrow to extend loans to their members and this borrowing is within the confines of the financial system of the country. The theory' emphasis lies in the need for organizations to prioritize understanding of risk management, and undertaking appropriate measures to avoid credit default. Credit default challenge was previously rooted in dependence on historical data due to insufficient up to date information (Crosbie et al., 2003), this was partially mitigated by the theory that explained, credit default as an event in the entire credit process. However unexplained were the different stages of credit default sources. This not only affects performance but also discourages investment. Default can happen throughout all the life of a financial asset, not only in maturity (Long staff and Schwartz, 1995). Merton, (1976) explained that organizations strive to spread risks to minimize exposure to credit risks in regard to assets and liabilities. A good risk indicator in Merton's framework is the debt to asset ratio and the spread is an increasing function of leverage. Merton model has the highly appealing feature of connecting credit risk to underlying structural variables. This theory was deemed relevant to cooperatives as it challenges them to retain solvency by clearly analyzing the debts from inception to maturity, and the possibility of financial losses due to changes in the credit quality of market participants (Bhamra et al., 2010). Even this theory partially justifies the relevance of managing of credit risk, which is currently absent in ACs credit facilitation process, it does not make mention the stakeholders that are vital in the credit facilitation process.

In line with collaboration mindset which is rooted in networking, amongst actors and institutions in the concept of national innovation system, the actor found a theoretical stance to justify the contribution networking contributes in innovation (Lundvall, et al., 2002; Lundvall, 2003). National innovation system(NIS) is described as an interactive system of existing institutions(universities), private and public (government) agencies directed towards production and diffusion of knowledge with in national borders (Guan and Chen, 2012; Fagerberg and Srholec 2008). This concept upholds the positioning of the national economic and social development using technology and innovation as the main driving force (Lundvall, 2003). NIS studies (Freeman, 1992) emphasize robust interrelations between technological development and the institutional embeddedness of innovative organizations. This robustness in technological development is greatly hinged on the level of resources devoted by each nation and institution to research activity. In this regard, financing institutions are described as the mainstream of innovation system as well as crucial determinants of the entrepreneurial ability to develop the new economy (Schumpeter, 1967). This is because, financial innovations provide specific institutional frameworks and interlinkages with government agencies, financial institutions, regulatory authorities, and research organizations to support innovation activities and strengthen technological capabilities at sectoral and national levels (Malerba 2002). Therefore, a collaborative tool wouldn't just be an innovation but a conduit for supporting the connection of the national financial system to the localized environment(ACs) thus addressing the concern of limited financial appetite by Government amongst the various credit providers.

In line with building lasting collaborations, information flow was noted as critical because it eases making of rational decisions. Mintzberg et al. (1976), and Simon, (1997) argue that decision making is the first step to problem-solving. Providing possible

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alternatives, evaluating these alternatives and choosing the most viable alternative as well as controlling the alternative decided upon. March, (2010) recommends rational decision making implying that the decisions are made under certainty both on alternatives and outcomes. However, in reality, with the absence of a collaborative tool ACs' decision makers in credit facilitation operate in uncertain, complex environments which results into limited credit opportunities', lending to unscreened borrowers that has resulted into the crisis. In light with the theoretical discussion, a collaborative tool, specifying stakeholders and their roles and its decision enhancement capacity was timely.

### **3 METHODOLOGY**

In line with article question as: How can the University collaborate with the Government and ACs to develop a credit facilitation decision tool? And the specific objectives of: To explain the financial performance reality of ACs in Kamwenge and Sheema districts, Uganda. b) To examine the credit facilitation decision challenges that affect financial performance in kamwenge and Sheema districts. c) To design a DE credit facilitation approach to mitigate the decision challenges. Evidence to addresses these objectives was drawn from analysis of surveys and focused group discussions conducted in June 2020. The questions of both data collection tools were insinc with the design science paradigm stages advanced by Hevner and Chatterjee in 2010. That is stage one was the relevance stage that mandated problem confirmation, where questions were about the financial performance, credit capital sourcing, credit terms and screening and credit reporting. Stage two was the design stage that mandated the development of an intervention to the problem confirmed. Stage three was the Knowledge base stage that presented the rigor extended across the credit facilitation decision processes. These stages supported the relevance for adopting this paradigm as it answered the research question which addressed a human problem via the creation of an innovative artefact the DECFA. This innovation was a technical capability accomplished using information systems. In the paragraphs that follow I describe what transpired at every day of the design science in detail in regard to the mixed methods and tools used.

In relevance stage, problem confirmation (Hevner and Chatterjee,2010) was emphasized. It unveiled the realities of financial performance for the years 2018 to 2020 given that before this period, all the ACs worked with, were not preparing financial statements, kept scanty documentation and had limited records managed. This also unveiled credit facilitation decision challenges in these ACs. Evidence at this stage was from 102 decision makers in 6 agricultural cooperatives of Kamwenge and Sheema districts which represented a response rate of 87.9% with the variance of 12.1% attributed to seasonality that is the harvesting season, where most managers and members were involved. To mitigate this, the researcher worked with the district cooperative officers to assist in calling the cooperators to participate which demonstrated government support, a sign of collaboration.78% of the respondents were literate that is, had completed the advanced certificate of education, the minimum standard to be considered as educated in Uganda (MOE, 2018). This signified the ability of cooperative stakeholders to navigate a simple DE collaboration tool developed in the study. Districts and ACs choice was based on Uganda Cooperative alliance (UCA) statistics with high decline rates of financial performance to which the study thought to get reliable information. With the robustness in data collected from multiple cases that supported generalization about the how, why and what of the network explored (Remenyi et al., 1998). The six cooperatives were, from Kamwenge the cooperatives were Kamwenge Tukulerehamwe ACE, Nkooma ACE, Nyabbani ACE, Bwizi ACE; from Sheema the cooperatives were Mikyerere ACE and Ankole Coffee Producers.

The unit of analysis were cooperative decision makers. Cooperative managers representing all persons in any form of decision making in the credit facilitation process; while the members being registered persons (meeting the cooperative registration criteria), the government officers, UCA officers that provided the cooperative statistics, the district cooperatives officers that authorized the study to be conducted at the cooperatives. And lastly the decision enablers who are the academia that supported the study to happen. With a mixed methods approach, quantitative survey provided facts and findings in a controlled environment that justified the need extent and this targeted to the cooperative services beneficiaries (Rule and John, 2011). The qualitative focused group discussions articulated the feelings, social situations, real issues at hand that is the cooperative managers' real problems of decision making about credit facilitation.

The data collection instruments used were the structured questionnaire and focus group discussion guide. Both tools were structured as; The first section addressing demographic data; second section addressed credit facilitation processes' decisions, third section addressed the financial performance. Clear instructions were provided on answering the questions. The instruments were refined through a pilot study undertaken in three ACs. Reliability ensured by using the internal consistency procedure, that is split-half technique showed an alpha of 0.969 which was good compared to the recommended alpha of 0.7. Validity was ensured through reducing subjectivity by linking data collection questions to the research question. In focus-group discussions validity was ensured through triangulation of findings, and ensuring the focus groups were comprised of members and cooperative managers, managers were kept from dominating the group discussions because the members who are savers in the cooperatives have a strong level of authority and thus their submission was respected in the discussions. In terms of ethical clearance, all participants involved in the research were provided with consent forms to seek for their approval to participate in the research. Anonymity and confidentiality were ensured by not disclosing the names of the participants. Participants were chosen involuntarily according to their involvement,

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knowledge and expertise of cooperative management. Quantitative Data collected was coded, and exported into the Statistical Package for Social Science (SPSS) version 21 for analysis. The analysis resulted into univariate analysis generating descriptive statistics mainly about demographics and individual variable parameters. This profiled the realities in financial performance and credit facilitation decision challenges. Qualitative data was analysed using thematic content analysis that clustered the data into different credit facilitation themes but also extract the decision challenges throughout the process. Noting that the study utilised the convergent mixed methods approach, quantitative data was triangulated by qualitative data to confirm the decision challenges. These decision challenges were translated into DE requirements for the credit facilitation tool in the design stage.

In the design stage, I translated the credit facilitation decision challenges extracted in the relevance stage into functional decision enhancement requirements for the credit facilitation tool developed. This process was meant to generate in context solutions for the challenges identified. To show the DE requirements new way of work, case scenarios for each of the credit facilitation processes was developed thus profiling better means of making credit facilitation decisions and these were presented in user case diagrams. The design of the user case diagrams was done using the Unified Modified Language (UML), diagrammatic notation for modelling systems using object- oriented concepts, presenting orderly description of activities (Larman, 1998). These UML provided a better way of managing the decision challenges rooted in their decision requirements as specified by the stakeholders. UML was chosen because it specified, visualised and enabled the construction of artefacts using easy to understand software systems. This design reflected how components within the tool worked together to achieve the decision enhancement goal with collaboration from the stakeholders. The outcome of how the different user cases diagrams operate represent the different credit facilitation processes were the credit facilitation suites joined together to create a DE Credit Facilitation Approach (DECFA) which was the collaborative tool. Data collected at this stage was secondary data on comparing how other DEs were operating with a mind-set of literacy level and ability to utilize simple technologies.

Stage three was the knowledge base, in this stage the study concerned itself with highlighting the contribution that the developed artifact was making to the body of knowledge. This was done by highlighting the different services that DECFA would provide, the different stakeholder roles that were enhanced through clarity and collaborations, the different decision improved by the new structures created and thus making an addition to the knowledge gap. This was done based on the different credit facilitation sub-processes.

### 4 RESULTS AND DISCUSSIONS

The financial performance reality of ACs in Kamwenge and Sheema districts, Uganda

**Table 4-1 the descriptive statistics of financial performance**

Agric-Cooperative	Share Capital UGX (0,000)	Assets value UGX (0,000)	Profits UGX (0,000)	Current Assets UGX (0,000)	Current liabilities UGX	Return on Assets	Return on equity	Current ratio
Nkoma ACE	24,00.00	6,383.00	219.48	16.20	5,369.45	3.44	9.15	0.30
Nyabani	940.00	700.00	67.00	67.00	67.00	9.57	7.13	100.00
Tukolerehamwen ACE	1,750.00	1,860.00	98.00	98.00	125.00	5.27	5.60	78.40
Bwizi ACE	900.00	650.00	56.00	17.50	56.00	8.62	6.22	31.25
Mikyerere Cooperative	40,000.00	100,000.0	2,700.00	8,500.00	45,000.00	2.70	6.75	18.89
Ankore Coffee Producers	45,200.00	53,800.00	2,450.00	7,800.00	45,200.00	4.55	5.42	17.26

**Source:** Field data 2018-2020

Table 4-1 shows the three financial ratios computed from the ACs namely; return on assets, return on equity and the current ratio. It was evident that Nkoma ACE posted a return on assets of 3.44%, return on equity of 9.15% and current ratio 0.3%, Nyabani ACE posted a return on assets of 9.57%, return on equity of 7.13% and current ratio 100%, Tukolerehamwen ACE posted a return on assets of 5.27%, return on equity of 5.6% and current ratio 78.4%, Bwizi ACE posted a return on assets of 8.62%, return on equity of 6.22% and current ratio 31.25%, Mikyerere cooperative posted a return on assets of 2.7%, return on equity of 6.75% and current ratio 18.89% and Ankore coffee producers cooperative posted a return on assets of 4.55%, return on equity of 5.42% and current ratio 17.26%.

With the foregoing objective of explaining financial performance realities in ACs, these findings revealed that ACs posted positive financial ratios indicating that cooperatives are able to realize investment growth in the short and long-term objectives over time if there was support on enhancing decisions made. The results also showed that none of the evaluated cooperatives posted over 100%

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in any ratios implying that they had no capability to make profits from their shareholders' investments, the cooperatives are unable to pay off all their current liabilities with their current assets and that the cooperatives don't have the capability to meet their short term obligations that were due within a year which was a dangerous position for these institutions depended upon for sustaining SSFs.

A comparison of financial performance realities results with literature by (Bhatt and Bhatt, 2013), provided a correlation that cooperatives experience inefficiencies that is poor recovery of loans. Due to this, they are concerned with using return on assets as an indicator of financial performance. Mismanagement and poor recovery performance should be addressed if financial performance is to be realized. Similar challenges exist in ACs in Tanzania, and technical efficiency has been emphasized as the major influencer that needs redress (Magali and Pastory ,2013). Reducing the number of loan defaults and improving the liquidity ratio greatly affect the costs of operations. With that confirmation from literature supporting the findings, it was evident that ACs were struggling financially demonstrated by their inability to make returns on owners' investments, inability of the ACs to make returns on assets (loans extended) and their liquidity ratios that were so low to meet the current liabilities for the ACs subsequently affecting the non-current liabilities. These findings contributed to knowledge on the current state of financial performance amongst ACs in Kamwenge and Sheema districts.

### **Credit facilitation decision challenges of Agricultural Cooperatives in kamwenge and Sheema districts**

In line with the context of understanding credit facilitation decisions challenges in ACs, it was evidenced that in credit capital sourcing, 83% of the respondents confirmed that cost of subscription decisions were made by the annual general meeting comprised of members. This was a common ACs practice (Msemakweli, 2012) however it undermined the input of the cooperative manager. Thus these decisions were made by non-technocrats making them risky as described by Ombado in 2010. There was limited involvement of all stakeholders in the credit capital sourcing decisions to an average of 40% and this was attributed to distance as the stakeholders were vast apart, thus in case of emergency decision to seek for capital, decisions were taken by just the available stakeholders, thus these decisions though binding were non- representative and not optimal. While selecting the external credit provider, the decision stakeholders had no guide for critical issues required to govern the lender choice. It was also revealed that 75% of cooperatives did not have a specified mechanism for selecting the most feasible source of credit capital and this was highly attributed to information insufficiency as observed by (Onyango, 2016).

In credit terms and screening decisions, the results revealed that 65% of the cooperators recognize the importance of credit duration determination but lack a chronological format to determine optimal credit durations for the different borrowers. As this was mainly hinged onto bargaining power of the senior cooperators versus junior cooperators. In sync with the above, over 71% of the respondents further revealed, that they only make payment payments towards their outstanding loan at cooperative meetings, which were noted to happen once a month at the earliest and in most cases later. This situation compromised the cooperative liquidity as some members could not access credit on time since it was being held by other creditors due to weak collection mechanisms like constant reminders and updated credit reports. This evidence a collection inefficiency issue which was attributed to limited engagements and triggers on credit due dates. The results also revealed that the cooperatives lacked an established sequence to setting the credit limits for borrowers, this was attributed to consideration of funds available and loan requests at a given time instead of members' capacity to repay. This contradicts financial sustainability as recommended by (Danso, 2015)

In credit reporting decisions, it was noted that a notification guideline and a constant credit notifications are vital in making credit facilitation decisions as supported by Experian, (2017). However, these two guidelines were lacking in the case of the Ugandan ACs, with results confirming that 68% of the cooperatives lacked structures to this effect. And therefore, it was difficult to effect constant reminders to the debtors and creditors which was a great disadvantage to credit collections and credit payments for the loan financiers of the SACCOs. All the above results presented decision challenges that affected the current credit facilitation process in ACs. This to tabled new knowledge but also demonstrated the urgency of solution from other stakeholders like the Government and the ACs that were facing these changes. This therefore gave basis for extracting a list of requirements for a Decision enhancement.

### **Functional requirements of decision enhancement credit facilitation tool**

In with the fore described credit facilitation decision challenge with decision enhancement mindset specifying that successful DE must be user needs oriented derived from user challenges (Knol, 2013). A set of functional requirements were those translated from the challenges and these are presented in Table 4-2 below:

<b>Credit facilitation decision challenges</b>	<b>Decision enhancement requirement</b>
<b>Under Credit Capital Sourcing</b>	
Ill-structured cost of subscriptions determination	DE should support the process of deciding on the cost of the membership subscription and equity sales.

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Process deficiency in external borrowing decisions	DE should provide a structured step by step flow in deciding on the external borrowing while capturing the different decisions of manager loan initiation, board approval, loan requirements verification and review of repayment structure
Irrational sourcing of credit capital	
Inactive manager participation in credit capital decisions	
<b>Under Credit terms and screening</b>	
Incoherent credit limits and lending rate	.DE should support determination of the credit duration for the respective credit giving based on the major considerations of the cooperatives meetings and funds review.
Unstructured credit application process	DE should support the determining of the lending rate for cooperative credit with input from the manager and cooperative AGM while reviewing the credit capital available.
Sub-optimal credit application evaluation systems	DE should assist in setting credit limits based on the considerations of expected harvest and cooperative meetings.
Lack of active manager participation across all credit facilitation process	DE should be able to enable users to check for standardization of the applications based on adherence to membership requirements, authenticity of information provided and adherence to the set credit limit.
Irregular engagements that delay decision making	DE should provide an optimal technique for credit approval, basing on the credit purpose, credit history and adherence to the membership requirements. DE should provide a mechanism for setting monitoring guidelines based on credit repayment schedule and reviewing credit limit
<b>Under Credit Reporting</b>	
Poor credit repayment procedures	DE should enable users to checking on credit repayment compliance based on payment schedules and value of collateral security.
Unstructured record management for the cooperative credit records	DE should be able to easy credit notification procedures for the members that have borrowed.
Unstreamlined credit reporting systems	DE should have the ability to send warning notification to borrowers and referee as well as setting dates for collateral attachments and bad-credit write off notifications to facilitate factual reporting

Created by the author from the Field data 2020

### Users, Technology, decision processes and the User case scenarios for the Credit facilitation decision tool

In line with article of design a decision enhancement tool, the DE requirements in table 4-2 supported the diagrammatical presentation of the different sub-process scenarios called the user cases, each sub-process user case formed a basis for the decision suite in the DECFA. Suites are special components of an artefact and in this regard the DE credit facilitation approach (Sol, 2008). The different sub-processes developed were: user management this the general management sub-process of the users; internal capitalization and external capitalization developed from the credit capital sourcing requirements. Credit terms and credit screening, developed from credit terms and screening requirements and credit reports developed from credit reporting requirements. However, given the collaborative nature of the tool to be developed, the tool had to consider fundamental elements of people, the technology and working within the decision making process thus facilitating collaboration. Noted to at this stage was the uniqueness of the tool to bring together these elements into collaboration thus partially addressing knowledge creation and innovation. The people are the different users that utilized the DECFA as per Table 4-3

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**Table 4-3 DECFA Users**

Use case	Users
User Management	Managers Members Administrators Government Board representatives AGM representatives External Lenders
Internal capitalization	Managers Members AGM representatives Administrator
external capitalization	Managers AGM representatives Board representatives External Lenders Administrator
Credit Terms	Managers Board representatives AGM representatives Administrator
Credit Screening	Members Managers Administrator
Credit Reporting	Managers Members AGM representative Board representative Administrator Government Cooperative Officers

**Source:** created by the author from the Field data 2020

People were at the center of the design as the service systems often link networks between the different users. The people in the study were cooperative decision makers involved in making credit facilitation decisions; cooperative members who provide membership subscriptions that are translated into internal capitalization and also come forth to seek the credit services; the annual general meeting (AGM) and the cooperative board representing the Government; the external lenders who provide external credit capital; the administrators that play a background role of maintaining cooperative information and the government that facilitates a stable financial system. Each of these users had specific decision challenges that relate to the process they are involved in. The DECFA development, described the interrelated credit facilitation decision making processes performed by the different users.

The aspect of technology was relevant as it emphasized the development of the DECFA. These technologies provided a facilitative and collaborative environment (in the form of tools, hardware and software). This was done with a mindset of collaboration supported by technology can only be beneficial if it is used as a tool, which can be adjusted to combine additional knowledge and experience, adopted within a local context (Wade, 2002). It was, imperative that the technology for enhancing credit facilitation decisions should be similar to the qualities of the relevant goals: such as “local relevance, repeatability, sustainability and predictability” (Steinberg, 2003).

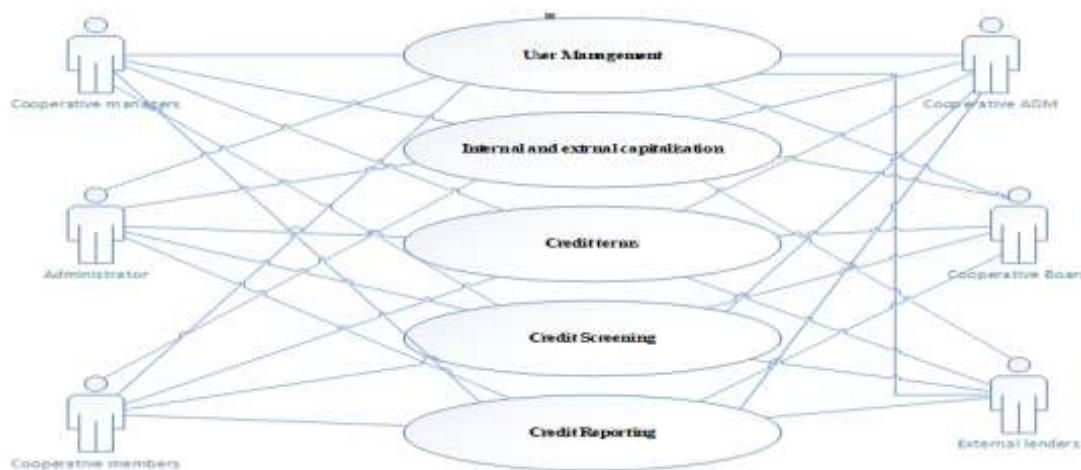
The decision process influenced the likelihood of actors to make effective decisions with flexibility. Flexibility can be described as the degree to which DEs are able to adapt to changing circumstances (Gosain, et al, 2004). The DEs as modular building blocks enable flexibility in complex and dynamic decision-making contexts (Knol, 2013). With the discussion at hand, the DECFA is:

*“a service system comprising of people, technology and processes, that provides a collaborative decision making environment for enhancing cooperative credit facilitation decisions, by facilitating credit capital sourcing information, credit terms and screening guidance and timely credit reporting standards to all cooperative stakeholders via services packed in an approach, with suites and their services”.*



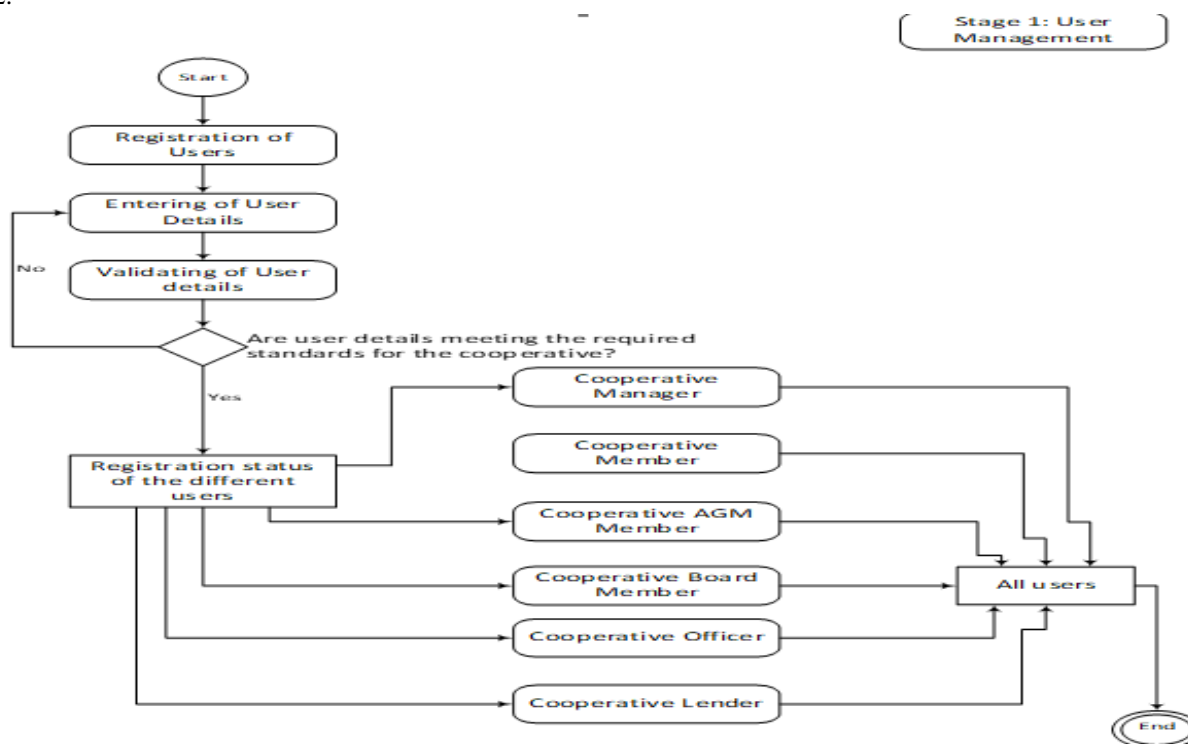
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The actors already described before make and influence credit facilitation decisions. This use case diagram provides a way to express the behaviour of the DECFA in that the actors in credit facilitation can easily be understood. Access to the approach defined based on the various roles performed relating to data and information. Generation or editing of data is restricted to staff of the utility through access authentication. These are subjected to validation by officers before they are considered to do anything in the model. The figure 4-2 below presents that the actors user case.



**Figure 4-2 Actors User Case Diagram**  
**Source:** created by the author from the Field data 2020

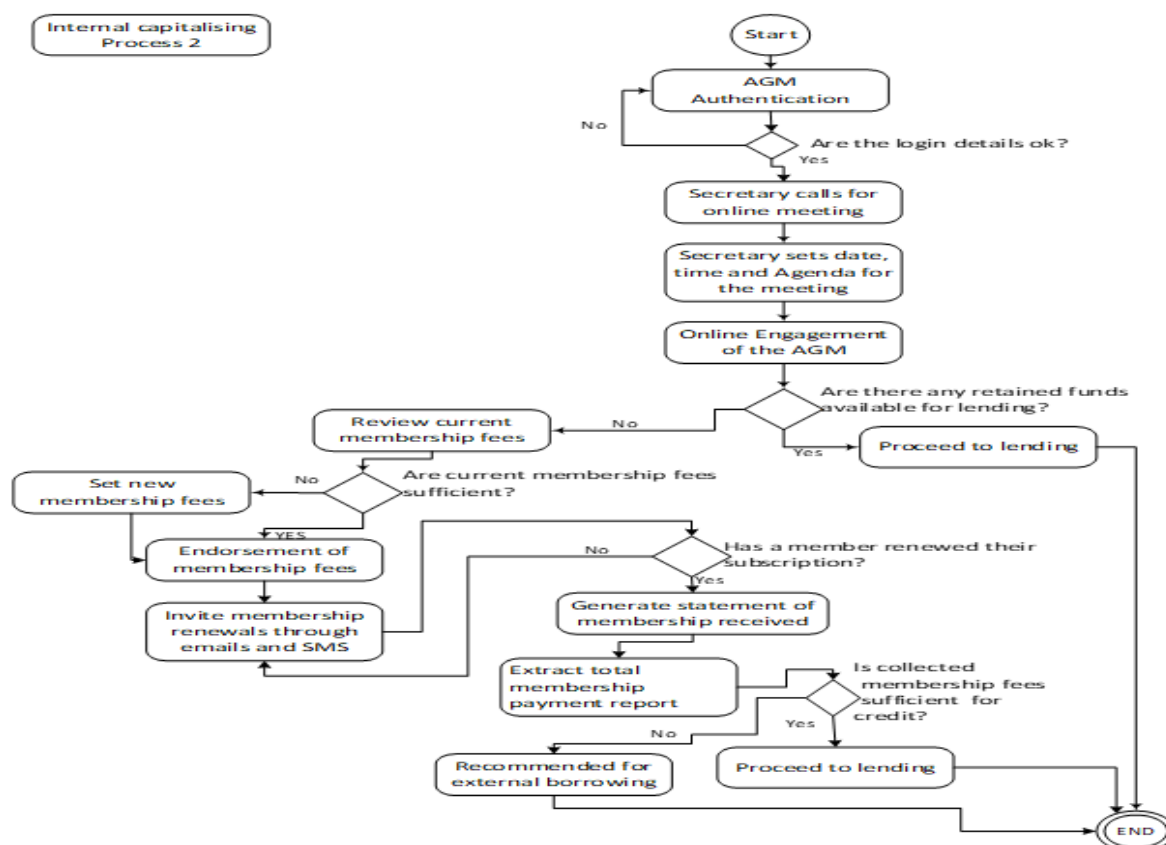
The user management scenario provided a registration into the forum in which a given user gets authenticated to participate in the credit facilitation process. DECFA provides a number of portfolios in which a user can be registered and granted access to use the tool, these are; cooperative manager, member, administrator, annual general meeting representative, district board representative and external lender. This scenario is an establishment of collaboration with government through board representation; academia at administrator and the other users representing he ACs. This diagrammatic representation of the user management is presented in Figure 4-2.



**Figure 4-2 User Management Suite**  
**Source:** created by the author from the Field data 2020

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Scenario two was internal capitalization. This was developed to capture the membership subscription payments by the various cooperative members. The way cooperatives raise credit capital was through member subscription. In order to pay this subscription fee, this fee has to be set and this can be done through a discussion forum amongst the AGM and this is implemented by cooperative managers who receive subscription fees from registered cooperative members. These members are already captured in the authentication suite. This implied that a non-member cannot be able to access the system which assists the managers to generate accurate records on how much has been generated from internal capitalization which simplifies credit forecasting. The activity diagram also generates the report based on the various financial periods for the ACs. These periods provided responsible planning for the credit facilitation decisions to be made (Maina, Kinyariro, Muturi, & Maitai, 2016). The diagrammatic presentation of internal capitalization is in figure 4-3.



**Figure 4-3 Internal Capitalization activity diagram**  
 Source: created by the author from the Field data 2020

The third scenario was external capitalization. It occurs when the credit capital required is more than that collected from the membership subscriptions. In this case the manager raises authorization from the board on whether to proceed with external borrowing through an online discussion chat created in the DECFA. Once an approval is given, the board also provides the maximum credit to be borrowed. Danso, (2015) recommends that the amount borrowed shouldn't be more than 40% of the assets of the cooperatives and in this case the financial assets. Once the amount is set, there is selection of the external lenders which starts with reviewing external lenders along side with their credit terms which are inputted in this suite. Based on the inputted details of the lenders and their terms of interest rate, repayment period and credit limit, the system preempts the most optimal lender and this is approved by the AGM members. This scenario evidences too of a triple helix model because the borrowing can either be from government or private financial institutions and this is solving a challenge confirmed by a university. These two sub-processes for selecting and approving external lenders are illustrated in the figure 4-4.

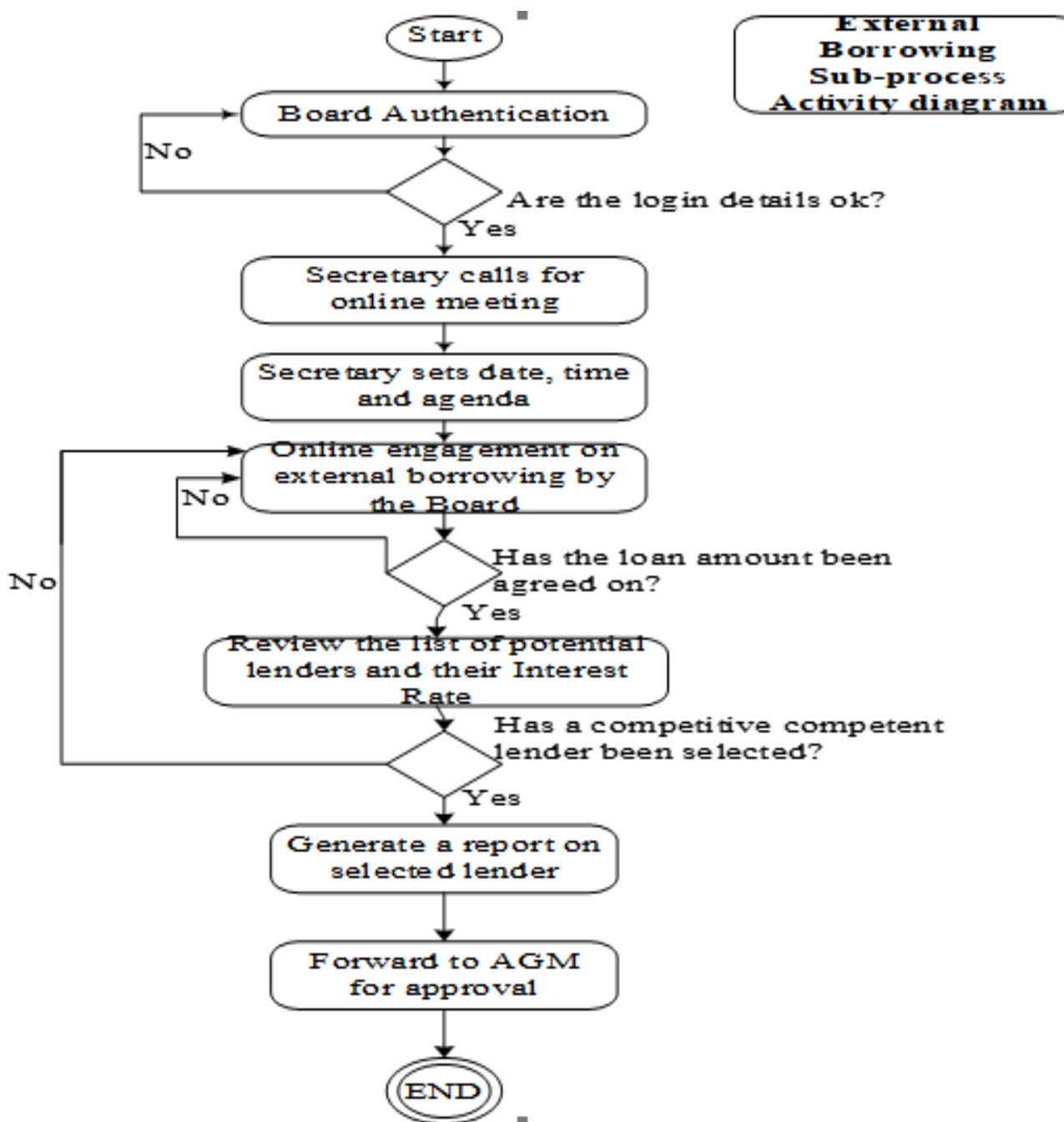


Figure 4-4 External Capitalisation Activity Diagram

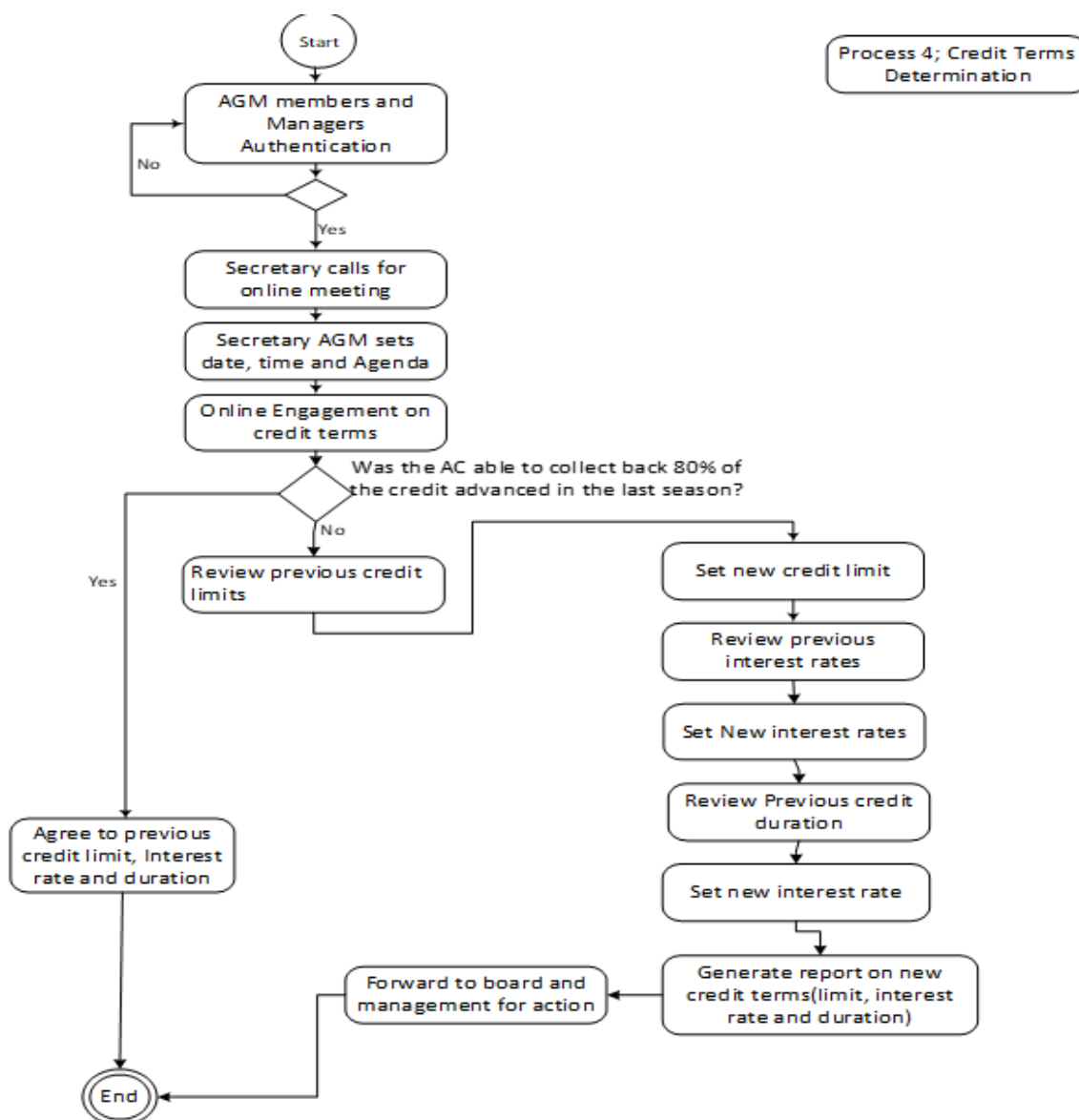
Source: created by the author from the Field data 2020

The fourth scenario was the credit terms determination and it's about determination of the credit terms that were confirmed vital in the credit facilitation process and these were credit limit, interest rate and credit duration. The DECFA provides a solution to the decision gap that there was lack of a logical flow of how not only to determine the credit terms but also how their flow should be. In the activity diagram, presented the AGM representative, board representative and manager meet utilizing the approach and review their last season performance, based on collections. The decision makers need to be aware that there are two strands of settings the credit terms; and they are dependent on whether the cooperative is purely utilizing internal capitalization or external capitalization. To set the credit terms when the cooperative is utilizing internal capital, the team of AGM representative, board representative and manager meet and agree whether to revise the lending rate. This is dependent on profitability on the credit administered the previous season. If the previous period was profitable then, the cooperative can opt to maintain previous lending rate. To set the credit limit, the decision makers refer to the meeting that sets the amount of loans to be issued as per the internal capitalization activity diagram. The credit duration as established in the exploratory findings should be dependent on the financial period for the cooperative, in

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respect to the cooperatives studied, the approach provided for three financial periods, the credit advanced has to fit into the respective periods.

If the cooperative is utilizing both internal and external capital, to set the credit terms the decision makers need to pay attention to the effect of that external capital on influencing the credit terms. In a meeting forum provided by the DECFA of AGM representative, board representative and manager, agreement on external lending as well as repayment terms, is made. To set the credit limit, the cooperative considers the number of loans budgeted and the amount set aside for each loan as the credit limit. To set the lending rate, the cooperative considers the interest rate of the external loan (Janda, 2013) plus a markup gap of 2% amount as basis set in the capitalization suites (internal and external). The duration is fixed on the financial period. This ensures that the cooperative managers are able to realize the repayment of credit advanced within the timing to repay the external loan. This suite ends with invitation of credit applications as the credit terms have been set. This scenario is diagrammatically presented in figure 4-5



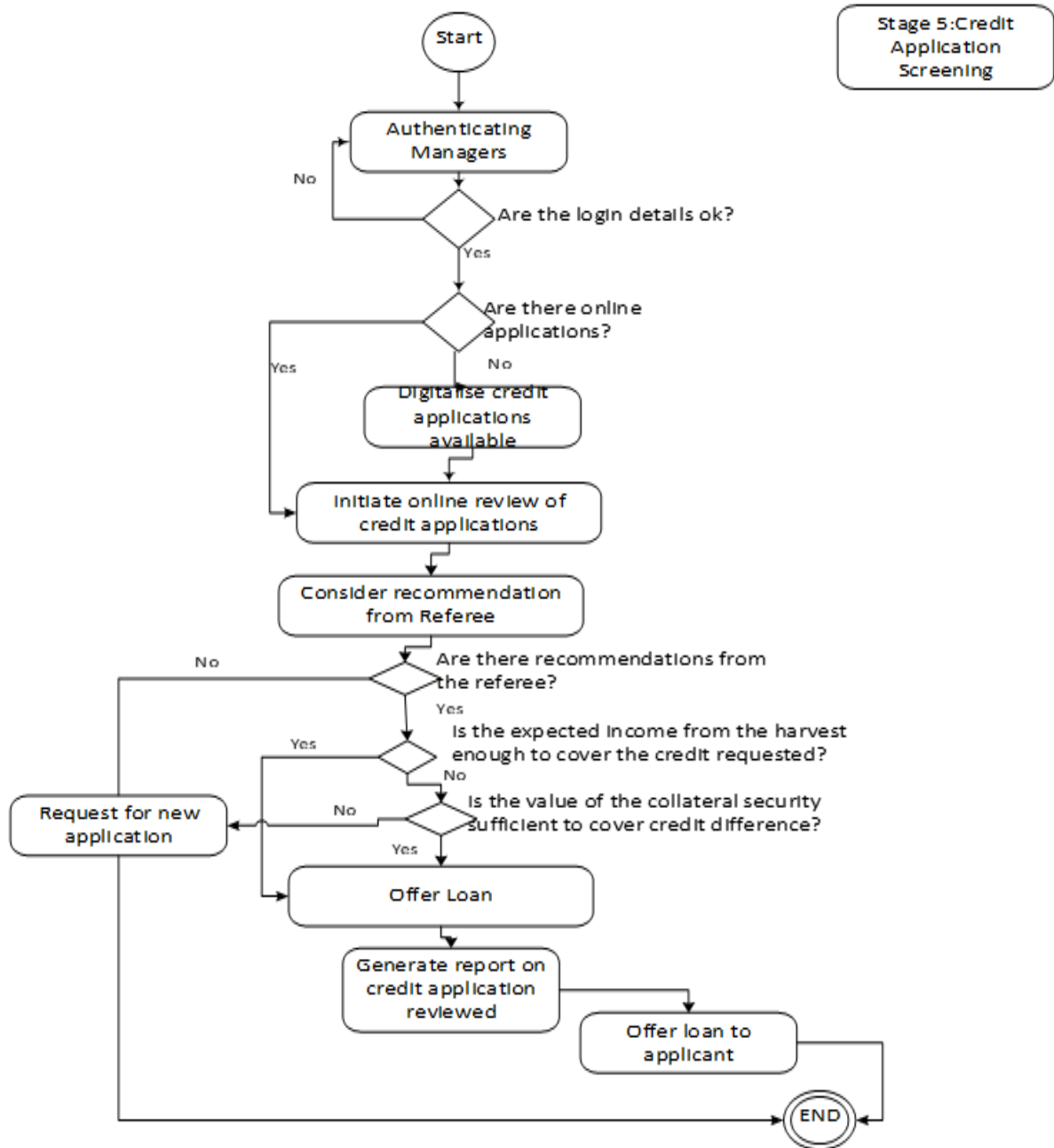
**Figure 4-5 Credit Terms Determination Activity Diagram**

Source: created by the author from the Field data 2020

Credit application was the fifth scenario, once this happens credit screening is inevitable and thus the credit screening scenario. This activity diagram was developed as a solution to ease decisions on vetting who qualifies for the credit and who doesn't. It starts by confirming who are the users are, this helps to ensure that only the specific users of this sensitive process are allowed. The managers then initiate an online review for all applications providing an entry of those applications not available online. In the online review of applications, the managers must consider three key requirements namely; recommendation from the referee, the expected income from the harvest in comparison to the total credit to be paid back and then the collateral security value. Out of this review a report

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is generated which clearly spells out if the applicants quality for the credit application or not. Credit screening it ends with dispatching of credit facilities to applicants. The activity-diagram is presented in figure 4-6



**Figure 4-6 Credit Application and Screening Activity Diagram**  
 Source: created by the author from the Field data 2020

The sixth scenario was credit reporting, with an assumption that credit has already been dispatched to the qualifying applicants after a thorough credit screening process. This suite starts with user authentications. Followed by extracting a list of debtors in comparison with the repayment calendar. The approach provides a schedule due on a monthly basis that ought to be followed by the debtors. The manager extracts a report on whether there has been compliance in regard to the set payment schedule. This is a point of decision making for the AGM, board and the cooperative manager. This scenario is presented diagrammatically in figure 4-7

Stage 6: Credit Reporting

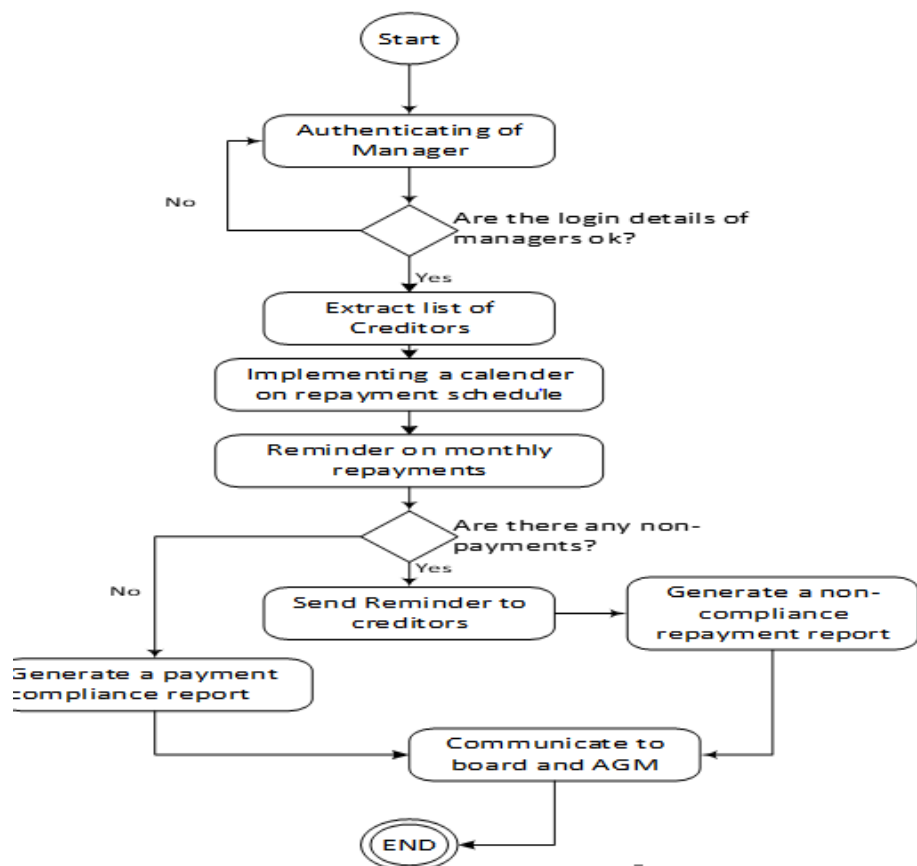


Figure 4-7 Credit Reporting Activity Diagram

Source: created by the author from the Field data 2020

With the developed DECFA scenarios, it was critical to extract a summary of the different scenario functionalities and how these will enhance the current way of work in ACs' credit facilitation which confirmed collaboration. These scenario roles are illustrated table 4-4

Table 4-4 DECFA' Scenario roles and functionalities

Scenario	Roles	Functionalities and services
User management	Membership recording, access management and records management	Facilitates data capturing, recording and storage of users Facilitate the specification of user log in capacity Enable display of information in the system
Internal Capitalisation	Discussion forum Membership setting Subscriptions	Facilitates invites and storage of online meeting. Facilitates discussion and decision making on the subscription to be paid by the members Facilitates discussion on raising the balance of credit capitalisation Facilitates registration of a member' subscription payment Facilitates recording of paid subscription Facilitates reporting on the members' unpaid up subscription
External capitalisation	Lender options External Credit Terms Discussion Forum Borrowing Report	Facilitates recording of lender options Facilitates determination of external credit terms Facilitates discussion of optimal lender Facilitates recording of loan borrowed and its payment procedures Facilitates reporting on the total credit capital available per season.

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Scenario	Roles	Functionalities and services
Credit Terms	Internal Credit Terms	Facilitates determination of the credit duration, interest rate and credit limits for the respective seasons. Facilitates accessing the loan application Form
	Loan Application Form Loan Application	Facilitates expressing the principal amount required Facilitates the computation of the interest rate based on the cost of external borrowing Facilitates recording of the collateral security and its value in form of cash Facilitates the loan application report that expresses internal capital versus loan applications.
Credit Screening	Screening Report	Facilitates a summary on: Member and loan requested Interest rate charged Expected Repayment amount Collateral Value Expected Harvest Income Total Membership paid Facilitates decision basis on qualification or non-qualification for credit applied for Facilitates decision on approve or disapprove credit application
Credit Reporting	Internal Loans status External Loan status	Facilitates a summary on: Borrower name Principle and interest rate Total Repayment made Loan Balance Facilitates decision on compliance based on payment Status (on track or deficit payment) Facilitates viewing of individual repayment schedules. Facilitates comparative decision making through viewing the details on: External sourcing provider Principle and Interest rate Loan period

With the development of the respective scenarios that presented the suites demonstrated in the sections before, a purposeful artefact designed to achieve a development purpose, enabling collaboration amongst stakeholders was birthed (Venable et al, 2012). The DE credit facilitation approach qualifies as a purposeful artefact as it profiles means in which it will bring decision stakeholders in credit facilitation to enhance their decisions thus improving their bankability to attract sustainable funding for the cooperatives. A six suited model called the DECFA, a collaborative tool enhancing credit facilitation decisions presented in figure 4-8. Was birthed.



**Figure 4-8 DE Credit Facilitation Approach (DECFA)**

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### 5 CONCLUSIONS

Considering the research question, this paper concludes to a number of stand points about the specific objectives:

In regard to objective 1, it had been noted previously through literature review (Yogo et al., 2016, UCA, 2014) that there were limited studies on financial performance realities on ACs in Kamwenge and Sheema districts in Uganda. This paper made a knowledge contribution by finding out that: All cooperatives posted 10% or less on ROA and ROE implying that they had no capability to make profits from their shareholders' investments. That cooperatives are unable to pay off all their current liabilities with their current assets and that the cooperatives don't have the capability to meet their short term obligations that were due within a year. And this was a dangerous position for these institutions sustainability and financing of the SSFs. This reality implied that unless such issues are addressed from their causes, ACs are likely to continue on their collapse track. This research too provided an entry to an area that was of limited interest to the academia and thus in future, it's vital for researchers to consider relating financial performance to other determinant factors.

In regard to objective 2. This study confirmed the relevancy and perception of credit facilitation decisions by the stakeholders around credit capital sourcing at 83%, credit terms and screening at 71% and credit reporting 65%. The study too confirmed ill-structured decision-making evidenced by: Limited involvement of all stakeholders in the credit capital sourcing decisions determination due to distance. Lack of an external credit selection guide. 75% of ACs lacked an optimal mechanism for selecting a feasible source of credit capital. 65% of the ACs lacked a chronological format to determine optimal credit durations. 71% of the ACs lacked a strong mechanism for enforcing credit collections. ACs too lacked a notification guideline to keep track of credit extended. These decision challenges in the credit facilitation processes were a demonstration of new knowledge tabled but also a trigger for stakeholders' o understand the magnitude of issues in-depth of ACs. And thus advocacy for joint mitigation through collaboration between Government and the ACs by the University which started with extracting a list of requirements for a Decision enhancement and specifying the different roles.

In regard to objective 3, the study concludes that based on the credit facilitation decision challenges confirmed in objective 2, their only solution was a credit facilitation tool developed from the user needs which were the challenges. The different challenges were translated into requirements transformed into their respective suites demonstrated using decision activity diagrams in figures 4.2 to 4.8. All emphasized how better decisions could be made contrary to what was happening before. For figures 4.1 and 4.2, there was demonstration of how the Government and the Academia have role to play in connecting the ACs with a world of information and opportunities which was not previously known. This role would enable ACs make informed decisions on financiers' expectations and thus improving on the bankability of ACs which was previously a challenge. The well respective suites connected together demonstrated how an AC should operate an optimal credit facilitation through mitigating the credit risk challenge identified in the theory thus contributing to extending the theory.

Lastly all the connected suites for credit facilitation birthed a six stage tool called the DE credit facilitation tool that was designed to achieve a purpose as per the research question and improve organizational management (Venable et al, 2012). This credit facilitation tool qualifies as a purposeful artefact as it profiles means in which it will bring decision stakeholders in credit facilitation to collaborate thus creating new evidence of how university, Government and Agricultural Cooperatives can work together to solution community problems.

For future studies, the study recommends a replica of a similar tool in other sectors that support the Ugandan economy like tourism given the effectiveness this can have on enabling and building lasting collaborations acceptable a national and community levels with the support of the Universities the hub of knowledge development.

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