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Designing of Accounting Information System for Small and Medium Enterprises: Application of PLS-SEM

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Abstract

Accounting information system is a complex and subjective concept that lacks a comprehensive conceptual framework. Previous AIS studies focused on the context of information system and its benefit. Moreover, the existing studies have revealed contradictory results. Some authors argue that full AIS adoption is necessary for all organizations, regardless their size. Others proposed a reduced level. Nevertheless, they are not precisly confirmed a subsystems of AIS that proclaimed as less important for SMEs. In response to this gap, the present study has attempted to design AIS framework for SMEs. As such, this research aims to decompose and identify the important sub-systems that constitute AIS. To fulfil this purposes, the research employed an exploratory research design that used Partial List Squire-Structural Equation Model. Primary data were collected from eighty SMEs. The study result confirmed that transaction-processing subsystem has the largest importance index followed by reporting subsystem. Even though, internal control is the least important, it was statistically significant in designing of AIS for SME. In the context of reporting, managerial reports (Budget preparation, variance analysis) are more important that financial accounting reports (FSEU). Regarding technology, whether IT is designed as simple as manual system or as complex as EP, its effect on management decision is minimum. Likewise, internal auditing practice of SMEs has very small impact in AIS alignment with accounting information users' satisfaction. Collectively, the study revailed that all subsystems of AIS are significantly important in the designing of AIS conceptual frame work for SMEs.

KeyWords: Accounting Inforfation System; Accounting; Conceptual framework; SMEs; PLS-SEM; Ethiopia.

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1. Introduction

These days, many developing countries are facing different socio economic problems. To reduce these problems, governments have supported small and medium business (SMEs) to strength their socioeconomic roles. Likewise, the government of Ethiopian has been supporting the growth of SMEs for decades. Unfortunately, most of the SMEs have failed to achieve their anticipated purpose. For example, SMEs in Ethiopia have contributed less than 20% to the gross domestic production (GDP). However, in developed countries, SMEs contribute more than 50% to GDP [1]. According to the World Bank report in 2015, accounting information system (AIS) is one of the major problems of SMEs in Ethiopia. It also asserted that most SMEs in Ethiopia do not maintain and practice complete AIS. AIS is a system which collects, records, stores and handles business transactions to provide financial information to decision-makers through using advanced technology or simple manual system or in between of the two[2]. The usefulness of the accounting information usually linked to the extent that accounting information can meet its user's demand [3, 4, 5]. In other word, accounting information demand and supply must be synchronized. If AIS does not designed to align with information demand, accounting information users cannot get adequate and quality information. In this regards, both excess and inadequate information supply can hinder the quality of decision. Reference [6] confirmed that AIS has advantages to the organizations, but sometimes create problems, information overload. As a result, information overload generates frustration and stress in the users. This means, the demand for accounting information is different based on the size and type of organization and complexity of its business transactions [5]. According to the information processing theory, AIS capacity must match AIS requirement of the organization. Thus, the primary indicator of AIS importance is information users' satisfaction (relevancy).As such, AIS is a type of an information system that provides important financial information for decision makers [6]. A system is a group of two or more interrelated components or subsystems that serve a common purpose. The information system is the set of formal procedures by which data are collected, processed into information, and distributed to users. Thus, like any system, AIS has two or more interrelated sub-systems. Regardless the type of technology, Reference [8] decomposed AIS in to three sub-systems. They are transaction processing, financial reporting and managerial reporting. Transaction processing has three cycles. They are revenue, expenditure, and conversion cycles. Transaction processing sub-system is considered as input in AIS [9]. Both financial and managerial reporting used data from transaction process. Reference [10] states financial and managerial reports are the major output of AIS. Nevertheless, they are different in purpose. The purpose of financial reporting is to provide financial information for external users [11]. Whereas, the primary functions of managerial accounting (reporting) are budgeting and controlling. The budget shows the expected financial impact of decisions and helps to identify the resources needed to achieve goals. Controlling implement the plans and evaluating operations by comparing actual results to the budget (variance analysis). Thus, the primary indicators of managerial reporting are budget preparation and variance analysis reports [12]. Furthermore, currently, many scholars and legislative bodies have emphasized on the importance of implementing internal control practices as a component of AIS For example, SOX legislation requires that management design and implement internal controls over the entire financial reporting process [11]. Researchers have also suggested the importance of alignment between internal audits, information security, and ARE professionals when developing AIS [13]. Moreover, controls must be in place within the information system to ensure only authorized users

have access to various parts of the accounting information system, segregation of duty, and adequate approvals for recorded transactions [14]. In the context of AIS and information technology, many researchers view AIS as a computerized system [4]. But not all AISs are computerized. For example, Romney & Steinbart [2], view accounting information systems as computerized, manual or between the two. Evidence also suggested that IT usually used in SMEs for administrative and operational purpose. It has very little impact on the way management makes decision. It is only important when it was integrated with firm's strategy [15]. AIS model grows from simple manual system to most advanced models like Enterprise resource planning (ERP). Manual processes, Flat file systems, Database approach, Resources, events, and agents (REA) model, and Enterprise resource planning (ERP) are the most known model of AIS. Except the manual system, the rest are categorized within simple to advanced computer based models. Based on business size and complexity of transactions, the manual system might be preferred to ERP or vice versa. Thus different AIS model found in different organizations and may coexist within a given organization [12] AIS of large businesses are extensively researched in business studies [16,13].Nevertheless, in the context of AIS framework for SMEs, there is lack of studies. Even the existing few studies revealed a contradictory results [15]. Some authors argue that adoption of all AIS' components is necessary for all organizations, regardless their size [17]. On the contrary, others propose a reduced level of AIS for Small business [18,19,20,21]. Besides, the existing few AIS framework design researches focused on individual sub-system [22,9,14]. Reference [13] has examined the design and implementation research in the domain of AIS, using a structured review of abstracts in top-level Information Systems, Accounting, and AIS journals from the year 2004 up to 2018. He confirmed that many previous studies examined individual sub-systems of AIS. Moreover, many of them focused on the context of information system (IS) and its benefit. He also noted that there is a lack of studies in the context of AIS dashboards for users and data sources to financial accounting practices. Even though, authors proposed a reduced level, they have not precisly confirmed a subsystems of AIS that proclaimed as less important for SMEs. As such, this research aims to decompose and identify the important sub-systems that constitute AIS. To fulfil this purposes, the research has formulated the following hypothesis:

H1: Transaction processing subsystem is significantly important in designing of AIS for SMEs.

H2: Reporting subsystem is significantly important in designing of AIS for SMEs.

H3: Internal control subsystem is significantly important in designing of AIS for SMEs.

Thus, to resolve the existing contradictions about AIS for SMEs, the following AIS conceptual framework for SME has been proposed.

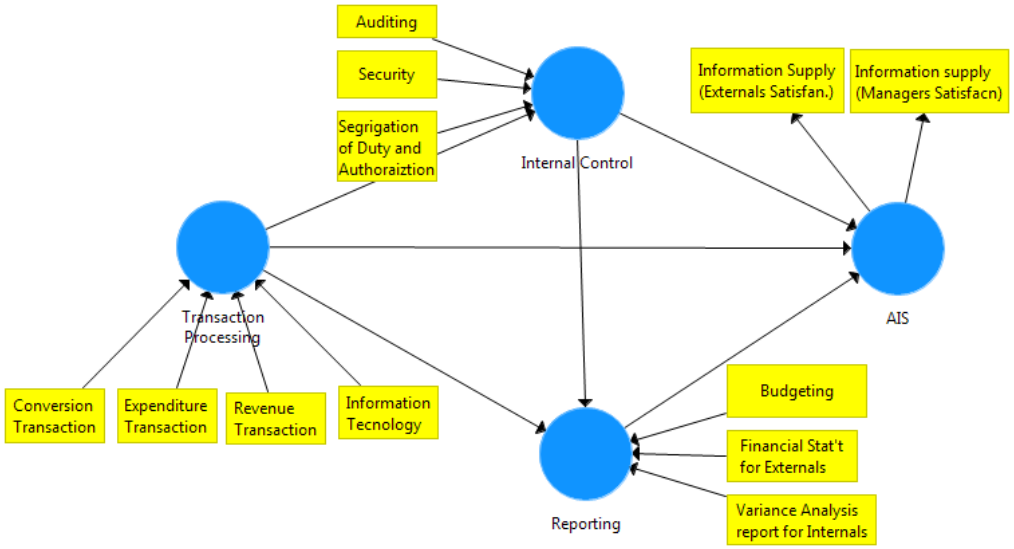

Figure 1: AIS conceptual framework for SMEs

2. Materials and Methods

Even though research designs are many and mutually exclusive, not all types could be appropriate for given research. To select the most relevant research design, a clear understanding of research objectives is compulsory. There is a paucity of literature about the conceptual framework of AIS for SMEs. As such, this study is exploratory type that develops framework. The study has explored the existing accounting information system and tested its alignments with the accounting information users' satisfaction. The study further assumed that whenever the existing AIS capacity is low, users' satisfaction also expected to be low and vice versa. To test this assumption, the study used partial list square-structural equation model (PLS-SEM). This method is usually preferred when the research objective is theory development and explanation of variance or prediction of the constructs [23]. This method is more discussed under section 2.4.

Variables and Measurement

Dependent variable

Accounting information system is the targeted dependent (endogenous) variable whose value measured by internal and external accounting information users' satisfaction. Users level of satisfaction measured based on the response that collected from managers and external users on a five-point Likert-type scale.

Predicting variable

Transaction processing is independent construct variable that used to gage the existing transaction processing capacity (use). Whereas, reporting and internal control are mediating construct variables between transaction processing and AIS construct variables. Since AIS is a complex concept, direct measurement is a very difficult task. Thus, differently from other studies, this paper measured AIS based on the relative score of TP, IC, and reporting. Furthermore, based on literatures, ten indicators have been identified to measure TP, IC, and

reporting. These indicators' capacities were measured by the frequency of use.

Table 1: Indicators and Constructs

Indicators	Measurement category	Constructs	Literature
Expenditure Transaction(ET)	Exogenous (Formative)	Transaction processing (TP)	[Error! Reference source not found.,Error! Reference source not found.,Error! Reference source not found.]
Revenue Transaction (RT)			
Conversion Transaction (CT)			
Information Technology (IT)			
Budget Preparation (Bu.)	Endogenous (Formative)	Reporting (Re.)	[Error! Reference source not found.,Error! Reference source not found.,Error! Reference source not found.,Error! Reference source not found.,Error! Reference source not found.]
Variance Analysis Report (VAR)			
Financial statement for external users (FSEU)			
Access to Data & Asset Security	Endogenous (Formative)	Internal Control(IC)	[Error! Reference source not found.,Error! Reference source not found.,Error! Reference source not found.]
Control over records and noncurrent asset			
Segregation of duty & proper transaction authorization			
Internal Auditing	Endogenous (reflexive)	Accounting Information System(AIS)	[Error! Reference source not found.,Error! Reference source not found.,Error! Reference source not found.,Error! Reference source not found.]
Managers satisfaction on accounting information			
Externals satisfaction on accounting information			

2.2 Sources of data and collection method

The study virtually used primary sources. Closed ended questions were used as a viable primary data collection instrument. To collect data about AIS capacity, frequency of use on a five-point Likert scale employed: 'Never' (=1), 'Almost never (=2), 'Occasionally/Sometimes' (= 3), 'Almost every time (= 4), 'Every time' (= 5). For accounting information users satisfaction a closed ended five point level of satisfaction Likert scale used: 'not at all satisfied' (= 1), 'slightly satisfied' (= 2), 'neutral' (= 3), 'Very satisfied' (= 4), 'Extremely satisfied' (= 5).

2.3 Sampling

The sample frame was only registered SMEs that are currently in five major cities of Ethiopia. The population comprehends manufacturing, merchandise and services types of SMEs. The sample size of this study was determined to make an allowance for the research model. In the PLS-SEM application, the minimum sample size should be 10 times the maximum number of arrowheads pointing at a latent variable anywhere in the PLS path model (Hair, Sarstedt, Pieper, & Ringle, 2012). This study path model had a maximum of four number of arrowheads pointing at the transaction processing (TP) construct. Therefore, based on the rule, the sample size

(n) of the study would be 40 (10*4). However, considering the risk of response rate, questionnaire distributed for 100 respondents. Finally, excluding missing value and errors, 80 sample units were used (two times the minimum requirement).

2.4 Data analysis

The study analysis procedure has two-steps involving an initial survey of the current system and analysis of users' needs, and then predicts the alignment between the current system and users' satisfaction. The extent that accounting information users satisfied on the existing AIS practice would be predicted using PLS-SEM . Partial least square (PLS) is an approach to structural equation modeling (SEM) that is extensively used in the social sciences to analyze quantitative data. However, PLS has not been as readily adopted in the accounting discipline. A review of the accounting literature found 20 studies in a subset of accounting journals that used PLS as the data analysis tool [24]. Despite this fact, this study has chosen PLS-SEM for the following major reasons. First, AIS subsystems are complex and abstract that cannot be measured directly. For this reason, SEM enables to incorporate unobservable variables measured indirectly by indicator variables and allows great flexibility on how the equations are specified [23] Secondly, this study has designed to measuring relationships among constructs, develop a general framework for linear modeling, and measure satisfaction of respondents. As such, SEM is likely to be the methodology of choice [24] Thirdly, the study model necessitates both confirmatory factor analysis for 12 indicators and cause and effect analysis among four constructs. SEM offers a distinctive advantage for this case, because it verifies both the validity of measures (constructs) in confirmatory factor analysis together with estimated relations in the econometric analysis [25]. As a result, the study tends to utilize the structural equation modeling to estimate the statistical significance of unobserved variables (constructs) in the empirical studies. Additionally, it would be a suitable choice when the structural model is complex; the data is non-normal; the construct is a single item; the questionnaire's scale is ordinal and binary; the measurement model is formative and reflexive; there is weak theoretical support.

2.5 Model Description

The PLS path model consists of two sub-models. They are measurement and structure model. The following section describes these models.

The measurement model

It displays the relationships between the constructs and the indicator variables. This model applies confirmatory factor analysis for the 12 indicators. It used to measure the significance and relevancy of formative and reflexive indicators. It also categorized constructs into exogenous and endogenous types. Endogenous constructs are dependent on the values of its neighboring exogenous constructs. From table 1, transaction processing (TP) is exogenous construct. Whereas, internal control (IC), reporting (Re), and AIS are endogenous or dependent constructs.

Structural model

This model displays the relationships (paths) between constructs. In Table 2, where the elements of the adjacency matrix are zero, elements of the coefficients matrix β are restricted to zero.

Table 2: Adjacency matrix (B) for the Structural model

Construct	TP	Re.	IC	AIS
TP	0	$\beta_{1,2}$	$\beta_{1,3}$	$\beta_{1,4}$
Re.	0	0	0	$\beta_{2,4}$
IC	0	0	0	$\beta_{3,4}$

Thus the equations of endogenous constructs are:

$$\boldsymbol{Re_2 = \beta_{1,2} TP_1 + Z_1} \text{.....eq. 1}$$

$$\boldsymbol{IC_3 = \beta_{1,3} TP_1 + Z_2} \text{.....eq. 1}$$

$$\boldsymbol{AIS_4 = \beta_{1,4}\, TP_1 + \beta_{2,4} Re._2 + \beta_{3,4} IC_3 + Z_3} \text{ .....eq. 3}$$

Structure model evaluation

This coefficient of determination R2

It was used to measure the model's predictive accuracy. The coefficient represents the transaction process, reporting, and internal control subsystems' combined effects on endogenous construct of the accounting information users' satisfaction. If non-significant constructs added in the model, R2 will increase. To adjust this excessive increase in R2, adjusted R2 shall be decrease. Thus, the adjusted R2 value measures the impact of adding a non-significant exogenous constructs and applicability of the entire structural model. If the difference between R2 and adjusted R2 is substantial, the model lacks predictive accuracy.

The f2 effect size

In the previous section, R2 was used to measure the predictive relevance of the study conceptual framework. However, it does not measure the scale and impact of dropping a given subsystem from the model. To do so, the appropriate statistical tool is f2. It was employed to measures the change in the R2 value when a specified exogenous construct is omitted from the model. This value is used to evaluate whether the omitted construct has a substantive impact on the accounting information users' satisfaction. Guidelines for assessing f2 are that values of 0.02, 0.15, and 0.35, represent small, medium, and large effects respectively [24]. As such, subsystems that mismatched with users demand would not be component of AIS; it shall be dropped from the framework.

For example, if a given business has implemented transaction processing sub system and information users are satisfied, the transaction processing subsystem retained in the framework. On the other hand, if the business implemented transaction processing system and then accounting information users are dissatisfied, transaction-processing subsystem shall be dropped from the framework. Finally, path analysis applied to test the research hypothesis as stated in equation 3.

Model test

Table 3: reflexive and formative measurement model test

Reflexive model test		
Type of test	**Purpose**	**Rule of thumb**
Indicator reliability	A measure is reliable (in the sense of test-retest reliability) when it produces consistent outcomes under consistent conditions.	The square of the indicator's outer loadings should be higher than 0.708.
Internal consistency reliability	used to judge the consistency of results across indicators on the same test	composite reliability: it should be above 0.7
Convergent validity	It is the extent to which an indicator correlates positively with alternative indicators of the same construct	AVE (It is the degree to which a latent construct explains the variance of its indicators) should be higher than 0.50.
Discriminant validity	it indicates how much indicators represent only a single construct	An indicator's outer loadings on a construct should be higher than all its cross-loadings with other constructs

Formative measurement model test		
Type of test	**Purpose**	**Rule of thumb**
Construct's convergent validity	Redundancy analysis	The correlation between with an alternative measure of the construct, using reflective measures or a global single-item construct should be 0.80 or higher
Collinearity of indicators:	To test whether indicators of a construct are correlated or not	Each indicator's tolerance (VIF) value should be higher than 0.20 (lower than 5). Otherwise,
The relative and the absolute importance of indicators	To test the significance of formative indicators	When an indicator's weight is not significant but the corresponding item loading is relatively high (i.e., > 0.50), the indicator should generally be retained.

Source: (Josephb F. Hair, Tomas, Hult, & Ringle, 2014)

3. Data analysis and interpretations

This section organized in to two major sections. The first sections test the quality of PLS-SEM model, and interpret its measures. Once the model result and quality analyzed, in the second section, the structure Model results have been analyze and interpreted.

3.1 Reflective Measurement Model Evaluation

The goal of the reflective measurement model assessment was to ensure the reliability and validity of the construct measures and to provide support for the suitability of their inclusion in the path model. The key criteria included were indicator reli¬ability, composite reliability, convergent validity, and discriminant validity. As stated in Fig 1 AIS was the only construct designed as a reflexive construct with two reflexive indicators: management satisfaction on information Supply and externals users' satisfaction on information supply.

Indicators Reliability: According to Table 5, value of managers' satisfaction on information supply and external users' satisfaction on information supply indicators' reliability are 0.82 and 0.75 respectively. Thus, all outer loadings of the reflective construct AIS are well above the minimum acceptable threshold value of 0.708.

Composite reliability: The composite reliability value of AIS is 0.879. This demonstrates that the reflective constructs have sufficient large levels of internal consistency reliability.

Convergent validity: Convergent validity assessment builds on the average value extracted (AVE) as the evaluation criterion. As of the algorithm result, the AVE of AIS is 0.785. This is above the required minimum level of 0.50. Thus, a measure of the reflective construct's AIS was large enough for convergent validity.

Table 4: Indicators' loading reliability, composite reliability, and average variance extracted

Reliability of AIS's indicators			Composite reliability	The average variance extracted(AVE)
R-Indicators	Loading (*l)*	Reliability(*l*		
MSIS	0.903	0.82		
ESIS	0.868	0.75		
AIS			0.879	0.785

Discriminant validity: In this case, discriminant validity is established when an indicator loading on a construct is higher than the cross-loadings of other constructs. Accordingly, Table 4 shows the loadings and cross load¬ings for AIS indicators. The highest cross loading values of MSIS and ESIS are 0.903 and 0.868 respectively. These values are maintained with their own construct (AIS). Thus, the MSIS and ESIS indicators represent only a single construct. This provides evidence for the discriminant validity of AIS.

Table 5: loadings and cross-loadings

Indicators	AIS	IC	R	TP
MSIS	0.903	0.684	0.777	0.820
ESIS	0.868	0.586	0.663	0.719

3.2 Formative Measurement Model Evaluation

Regarding the formative measurement model evaluation, co-linearity, significance, and relevance of the outer weight testes have been employed.

Co-linearity: The only result that was important for assessing collinearity issues was the Variable inflated factors (VIF) tolerance value which supposed to be <5. According to the results in table 5, the lowest and the highest VIF values were 1.241 and 2.174 respectively. Hence, they were below the maximum threshold value of 5 and above the minimum threshold value of 0.2. Thus, co-linearity problem is not an issue for the formative measurement model.

Table 6: Variable inflated factors

RT	ET	CT	IT	Au.	Se.	SDTA	Bu.	VA	FS
1.909	1.837	1.632	1.484	1.241	1.391	1.613	2.174	1.633	1.6

Significance and relevance of outer weight: to test the significance and relevance of formative indicators, 5000 bootstrap samples were used. Table indicated that except auditing and IT indicators, all formative indicators' weight are significant (p<1%).

Table 7: Significance and relevance of outer weight

Constructs	**Transaction process**				**Internal Control**			**Reporting**		
Indicators	ET	RT	CT	IT	SDTA	Se.	Au.	Bu.	VAR	FSEU
Weight	0.554	0.307	0.299	0.101	0.558	0.493	0.169	0.492	0.356	0.328
t-stat	5.400	4.462	3.626	1.112	4.788	4.684	1.730	4.060	3.680	2.644
p-Values	0.000	0.000	0.000	0.266	0.000	0.000	0.084	0.000	0.000	0.008
Sig. level	*	*	*	NS	*	*	NS	*	*	*

*p<1%; NS: Not significant

When a formative indicator's weight is not significant but the corresponding item loading is relatively high (> 0.50), the indicator should be retained [23]. Though auditing and IT are insignificant, they are retained in the model. Because, the outer loading value of auditing (0.737) and IT (0.540) are found to be more than 0.5. Thus, all 10 formative indicators are important components of the measurement model. Note that, in the conceptual model, not all indicators were supposed to be equally important. Thus, to gage indicators relative importance,

their outer weight, t-stat, and p value were compared.

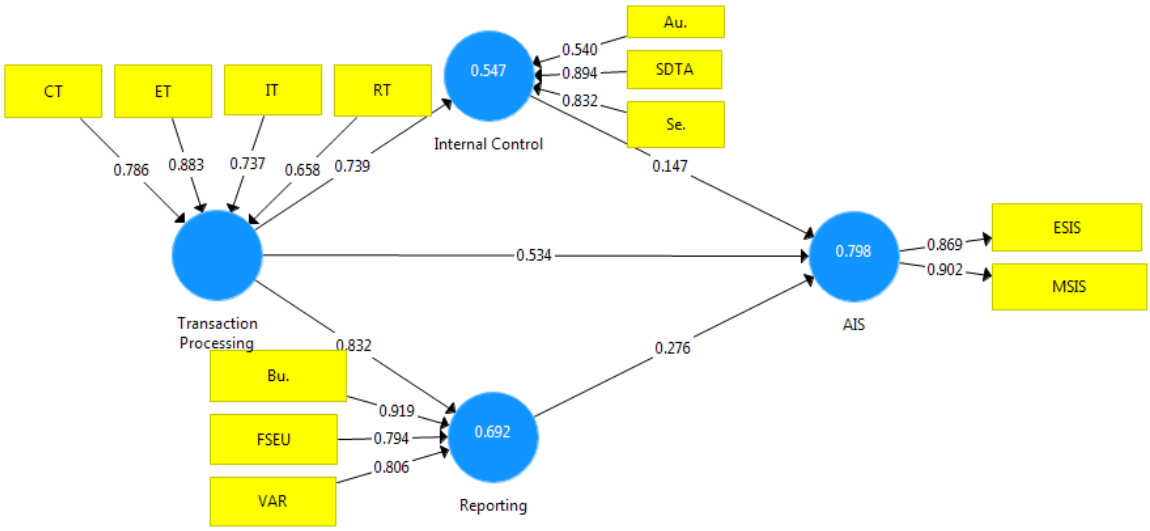

Figure 2: loading, path coefficient, and R2

3.3 Structure model evaluation and results

This section has examined the model's predictive capabilities and the relationships between the constructs.

Collinearity: unless each predictor constructs' tolerance values are higher than 0.20 but lower than 5, eliminating, merging or creating higher-order constructs would be the possible remedy to treat collinearity problems [23]. Collinearity tested for transaction processing (TP) as predictors of internal control (IC), reporting (Re), and AIS. Then, IC and Re. tested as predictors of AIS. Table 6 shows the VIF values of the analyses. As can be seen, the maximum and minimum VIF values are 4.161 and 1 respectively. Since the collinearity issue was not problem in this structure model, eliminating, merging, or creating higher-order constructs would not be necessary.

Table 8: VIF values for predictors

	AIS	Re.	IC
TP	4.161	1.000	1.000
Re.	3.276		
IC	2.226		

Coefficients of determination (R2): This coefficient is a measure of the model's predictive accuracy. The predictive accuracy of the stipulated model is 0.798. This means, transaction process, internal control and reporting subsystems have explained more than 0.79 of variance in accounting information users satisfaction. This value is high (substantial) [23]. In addition, in table 7, the difference between R2 and adjusted R2 is very small (0.008). Thereby, the stipulated conceptual framework of AIS for SMEs is robust. Moreover, it significantly affect the accounting information users' satisfaction ($p<1\%$; $t=17.82$). In the context of systems integration, transaction-processing subsystem is an important input for reporting and internal control

subsystems. The R2 result confirmed that transaction processing subsystem predict 0.692 and 0.547 of variances in reporting and internal control subsystems respectively.

Table 9: Coefficient of determination (R2)

	R^2	T stat	P value	R^2 Adjusted
AIS	0.798	17.815	0.000	0.790
Re.	0.692	9.489	0.000	0.688
IC	0.547	8.530	0.000	0.541

The f2 effect size: Transaction processing, reporting, and internal control subsystems have f2 effect sizes of 0.352, 0.112, and 0.044, respectively. Hence, transaction process has a large effect size (importance) on the accounting information user's satisfaction. However, reporting and internal control subsystems' f2 effect sizes were small. Relatively, reporting subsystem scored a better importance than internal control subsystem. As such, the relative importance scale of TP, IC, and reporting in implementation of AIS for SMEs are significantly different.

Table 10: f2

	f^2	Level	Decision
TP	0.352	Large	Retained
Re.	0.112	Small	Retained
IC	0.044	Small	Retained

3.4 Hypothesis Testing

Path analysis was applied to test the conceptual model using structural equation modeling approaches. These results in table 9 confirmed that the direct importance of transaction processing, without reporting and internal control, had a path coefficient of 0.534. Relatively, the total importance of transaction processing, with reporting and internal control subsystems, had a path coefficient of 0.873 ($t=28.22$; $p<0.01$). When IC and reporting included in the model, the importance of transaction processing is increased by 63.5% (0.873-0.534/0.534). Thus, the statistical result validated the hypotheses "transaction processing is the important subsystem in designing of AIS for SME". This result is in accordance with [27] who confirmed that transaction process importance for SMEs.

Table 11: Effect on AIS

	Total Effect (Direct + Indirect)	Significance level	T-stat	P-value	Hypothesis	Hypothesis supported
TP-AIS	0.873 (0.534+0.339)	*	28.217	0.000	H_1	Yes

Re.-AIS	0.276	**	2.106	0.035	H_2	Yes
IC-AIS	0.147	**	2.500	0.012	H_3	Yes

*p<0.01;**p<0.05

In the proposed conceptual model, the path coefficients of reporting and internal control subsystems were 0.276 and 0.147 respectively. The statistical result confirmed that reporting is the significant important subsystem of AIS (t=2.11; p<0.05). Consistent with the study framework, this result supports the notion that "reporting is the important subsystem in designing of AIS for SME". In addition, In support of the hypothesis "internal control is the important subsystem in designing of AIS for SME", the statistical result confirmed that internal control is significantly important in designing of AIS for SME (t=2.5; p<0.05). This is in accordance with [26, 14] who confirmed internal control performance has a direct impact on accounting information quality.

4. Discussion

In the context of accounting, a few attempts have been made so far to design AIS framework for SMEs. To fill this gap, the present study has identified, measured, and connected the possible subsystems of AIS using a comprehensive monologue model. To validate the proposed model, a latest statistical method namely PLS-SEM was employed. Primarily, this tool was used to verify whether an important subsystem has been overlooked or less important subsystem loaded into the conceptual model. In the dearth of emperical studies, identifying, conecting, and measuring of multiple AIS sub-systems was not an easy task. Thereby, the study opted to decompose AIS in to its smaller components based on theoretical review. The result confirmed that transaction processing, internal control, and reporting (managerial and financial accounting) are the important subsystem of AIS. The usefulness of accounting information is usually linked to the extent that accounting information can meet its user's demand [4, 5]. Seemingly, accounting information demand and supply must be synchronized. The study posit that when AIS does not designed in a way to align with information demand, accounting information users cannot get adequate and quality information. Accordingly, the result confirmed that the primary indicator of AIS was information users' satisfaction (relevancy). In this context, transaction processing, internal controlling and reporting constructs collectively have explained more than 79% of variance in AIS users' satisfaction. Like any other information system, AIS is the set of formal procedures by which data are collected, processed into information, and distributed to users. Thus, it has two or more interrelated sub-systems. Nevertheless, previous studies focused on individual sub-system of AIS [13, 15]. As such, this study is the first to assess all subsystems of AIS in a unified equation and gaged their relative contribution for the entire system. To achieve this purpose, the study has employed size effect analysis. Accordingly, transaction processing, reporting, and internal control subsystems have effect sizes of large, small, and small, respec-tively. Despite the small effect sizes of reporting and internal control subsystems on the accounting information users' satisfaction, the results are above the minimum requirement (0.02). Regarding subsystems integration, reporting and internal control subsystems are significantly dependent on the proper design and implementation of transaction processing. The f square result shows that dropping of transaction processing subsystem from the conceptual

framework can reduce the predictive ability of the model by 35.2% (R square). Specifically, the most important indicators of transaction process subsystem are expenditure transaction cycle followed by revenue transaction cycle. Accordingly, transaction process subsystem is the cornerstone in designing of AIS for SMEs. Researchers have also suggested the importance of alignment between internal audits, information security, and professionals when developing AIS [13]. Furthermore, controls must be in place within the information system to ensure that only authorized users have access to various parts of the accounting information system. In this way, internal control supposed to insure segregation of duty and adequate approvals of transactions [14].This study confirmed that internal controlling is significantly important in the designing of AIS for SME. Segregation of duty and proper authorization of transaction (SDTA) is the 1st important indicator of internal control subsystem followed by data and asset protection (Security). Researchers have suggested the importance of internal auditing practice [13]. Nonetheless, the confirmatory factor analysis result has confirmed that, relative to SDTA and security, internal auditing practice of SMEs has very small impact in AIS alignment with accounting information users' satisfaction. In this context, this research result is different from previous studies. Regarding the reporting subsystem, the study result confirmed that budget preparation, variance analysis report (w=0.356; t=3.680), and financial statement for external users (w=0.328; t=2.624) are the 1st, 2nd, and 3rd important indicators of reporting subsystems respectively. Thereby, managerial reports (Budget preparation, variance analysis) are more important that financial accounting reports (FSEU). This result is also supported by [5]. The possible logic behind managerial report importance than financial report for externals is small business that operate in Ethiopia are not legally obligated to present financial statements for external users. In the context of AIS and information technology, many researchers view AIS as a computerized system (Elsharif, 2019).But not all AISs are computerized. For example, (Romney & Steinbart, 2012) Evidence also suggested that IT usually used in SMEs for administrative and operational purpose. It has very little impact on the way management makes decision. It is only important when it was integrated with firm's strategy [15]. Similarly, in the context of SMEs, this study confirmed the small impact of IT on the variation of accounting information users' satisfaction. Noticeably, among the four indicators of transaction processing subsystem, IT is found to be the least important. This result is also supported by [7]. For the past half of a century, AIS model evolves from simple manual system to most advanced models like Enterprise resource planning (ERP). Manual processes, Flat file systems, Database approach, Resources, events, and agents (REA) model, and Enterprise resource planning (ERP) are the most known model of AIS. Except the manual system, the rest are categorized within simple to advanced computer based models. Based on business size and complexity of transactions, the manual system might be preferred to ERP or vice versa [12]. In this case, the study confirmed that whether IT is designed as simple as manual system or as complex as EP, its effect on management decision is not statistically significant.

5. Conclusion

The importance of full AIS adoption for large business is extensively researched. Nonetheless, in the context of AIS framework for SMEs, there is a dearth of studies. Even the existing few studies revealed a contradictory results. Some authors argue that full AIS adoption is necessary for all organizations, regardless their size. Even though, others proposed a reduced level, they have not precisly confirmed a subsystems of AIS that proclaimed as less important. To resolve this contradiction, the research decomposed AIS into its subsystems. This helps to identify a subsystem that does not contribute to the accounting information users' need. Accordingly,

transaction processing, internal control, and reporting constructs were designed as the main subsystems of AIS. Using structural equation model, the proposed subsystems were systematically linked to accounting information users' satisfaction. Specifically, a coefficient of determination has been used to test the predictive accuracy and viability of these subsystems. Collectively, the model has explained more than 0.79 of variance in accounting information users' satisfaction. These means, transaction processing, reporting, and internal control subsystems can significantly affect the accounting information users' satisfaction. Thereby, there is a strong statistical evidence on the importance of full AIS adoption for SMEs.

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