Collinearity and Reliability Indices of Accounting Management Efficacy Inventory (AMEI)

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ABSTRACT

Psychological tests for students' efficacy in accounting management inventories are not yet conducted, nor are they made. This study aimed to create an inventory that would test the accounting majors' efficacy in managing to account. Bandura's self-efficacy theory and Knowledge Management were used in this study. Data were gathered from the selected participants, the first year to fourth year accounting majors in UM Digos College enrolled in SY 2015-2016. A quantitative method of research was used in the study. A test questionnaire composed of four (4) dimensions with ten (10) test items each was used to gather the numerical data concerning accounting majors' efficacy in accounting management. Research tools used were Mean, Cronbach's Alpha, and Collinearity. Accounting Management Efficacy Inventory (AMEI) demonstrated excellently with a mean of 3.61. Items with a reliability coefficient fall between .957-.959 are all reliable. Using collinearity diagnostics, constructs were all proved valid. Accounting Management Efficacy Inventory (AMEI) is useful to test students' confidence on how they manage to account. This will help instructors create new and diverse teaching strategies and for their future students who want to take up any accounting courses.

Keywords: collinearity, reliability, accounting management efficacy inventory, UM Digos

INTRODUCTION

As defined by American Accounting Association (AAA), accounting is the process of identifying, measuring, and communicating economic information to permit informed judgment and decisions by users of the information (AAA, 1966). Various processes are needed to be done before attaining the aimed results. Like any accounting course, students undergo different subjects, processes, computations, and knowledge before stepping to another year and before graduating. Managing accounting knowledge is surely tough. Information may pile up, and when students get filled up, they may tend to forget, resulting in poor performance. Psychological tests for accounting students' efficacy on accounting management would help the students know the areas that needed attention and areas to enhance and adjust. But psychological tests for students' efficacy in accounting management are rarely seen and conducted.

As defined in Vocabulary (2015), efficacy is a more proper way to say effectiveness, both of which came from the Latin verb *efficere* "to work out, accomplish." The efficacy of a person is how well he/she works or brings the results one hoped for, or in other words, it is ones' confidence. Students' success in accounting subjects is influenced by major factors such as mathematical skills, analytical skills, verbal skills, and basic knowledge in accounting. These major factors predict the student's success in higher accounting (Lee et al., 2014). Aside from having those competencies, accounting students must also possess enough confidence to accomplish things. Also, confidence in managing all the accounting information they got is very useful in future lessons. Certain components are considered by Stuart Garner (2010) in his research regarding personal knowledge management and student learning that has similar processes in the definition of Accounting. As Garner's research stated, students who are well organized and manage their knowledge well generally achieve higher than those who do not.

The research was also conducted in the Philippines. An example of this is the study conducted by Arganda, A. et al. (2014) about the needs and problems of second-year accountancy students. The specified needs/problems encountered by the second-year accountancy students are based on these terms: the academic, domestic, and community.

This study is about the Development of the Accounting Efficacy Inventory for Accounting Majors of UM Digos College. UM, Digos College is one of the collegiate institutions in Davao del Sur. It has produced globally competitive professionals in any sector. Its mission is to strengthen supportive and caring

learning conditions geared towards academic and non-academic excellence, multi-competence, and ethical responsibility through democratizing access to quality education. And its vision is to be a leading institution of higher learning driven by holistic excellence through proactive education that meets the local and international communities' demands.

This study's main purpose was to develop Accounting Management Efficacy Inventory (AMEI) for Accounting majors in UM Digos College and determine the collinearity and reliability indices of the Accounting Management Efficacy Inventory (AMEI). Specifically, this study also aimed to answer the following questions: (1) What is the Accounting Management Efficacy Inventory level? (2) What are the Accounting Management Efficacy Inventory reliability indices? and (3) What are the collinearity indices of THE Accounting Management Efficacy Inventory?

METHOD

The study used the quantitative research method. This method is appropriate for the current study to develop a valid and reliable psychological test, Accounting Management Efficacy Inventory for Accounting Majors. Wherein, dimensions and test items assigned in each would be verified and tested based on the gathered numerical data concerning the efficacy of the UM Digos College accounting majors (1^{st}-4^{th} year) in accounting management that to be analyzed mathematically using statistics. The present psychological test developmental study involved 194 selected participants from the first year to fourth year Accounting Majors in UM Digos College enrolled in the first semester SY 2015-2016. Demographic data collected included name, age, sex, year, and section. The sample consisted of 140 females and 54 males with an average age of 18.36.

The researchers used an expert validated survey questionnaire to develop the Accounting Management Efficacy Inventory for Accounting Majors in UM Digos College. The test questionnaire was composed of four (4) dimensions and ten (10) test items for each dimension. The items were designed using the format of Self-Efficacy Instruments (Bandura, 2006). The verbal description was also adopted from Roberts' (2008) research about instrument development. The instrument was composed of two parts. Part I was intended to collect the demographic profile data of the participants. Part II contained the test items used to test the efficacy of the first year to fourth year accounting majors in UM Digos College in accounting management.

The following statistical tools were used in analyzing the data retrieved from the respondents of the study. **Mean** was used to determine the level of Accounting Management Efficacy Inventory (AMEI), **Cronbach's Alpha** was used to determine the reliability indices of Accounting Management Efficacy Inventory (AMEI), **Collinearity** was used to measure the validity of Accounting Management Efficacy Inventory, **Tolerance** was used to measure collinearity among the variables of the research and **Variation Inflation Factor (VIF)** was used to measure collinearity among the variables of Accounting Management Efficacy Inventory (AMEI).

RESULTS AND DISCUSSION

Level of Accounting Management Efficacy Inventory

The Accounting Management Efficacy Inventory results are presented in Table 1.1 to 1.4; four dimensions were examined: Retrieving Information, Analyzing Information, Presenting Information, and Collaborating Around Information. Each of these constructs has 10 items, and the mean was used to describe its level and equivalent.

Table 1.1 *Level of Accounting Management Efficacy Inventory in terms of Retrieving Information*

ITEMS	Mean	Descriptive Equivalent
I can retain the knowledge I acquired from reading the current accounting textbook.	3.64	Much confidence
I can retain what I have learned in accounting.	3.66	Much confidence
I can easily recall accounting lessons than other subject's lessons.	3.40	Moderate confidence
I can recall and relate past lessons to the current lesson.	3.52	Much confidence
I can answer problems from past lectures.	3.36	Moderate confidence
I can recall what I have learned through remembering my own constructed summaries of it.	3.61	Much confidence
I can immediately remember our lessons by picturing out its given sample problems.	3.66	Much confidence
I can recall past learning in accounting through meaningful knowledge management I had created.	3.55	Much confidence

Table 1.1 *Level of Accounting Management Efficacy Inventory in terms of Retrieving Information (con.t)*

ITEMS	Mean	Descriptive Equivalent
I can still remember information related to accounting that was already accumulated in my brain.	3.61	Much confidence
I can easily retain information created through dual coding (creating visual and verbal memory).	3.44	Moderate confidence
OVERALL	3.55	Much Confidence

In the first dimension, 7 out of 10 items are interpreted as much confidence, which means that the students have much confidence that they perform well in that particular field of accounting management. Three out of ten items are interpreted as moderate confidence, which means that the students have moderate confidence that they perform well in that particular field of accounting management. The lowest level is identified on item 5, "I can answer problems from past lectures." Lee et al. (2014) researched how lower courses affect the efficacy of students in accounting subjects. One of the factors that they included is basic knowledge in accounting. If students can retain what they have learned, it will surely help them in higher accounting. The overall mean of the first dimension is 3.55, described as much confidence. This means that students have much confidence that they can perform well in that particular accounting management field.

In the second construct, Analyzing Information, the overall mean is 3.71, which means that the students have much confidence that they perform well in that particular field of accounting management. Half of the times are interpreted as much confidence, and the remaining are interpreted as moderate confidence. The highest level is identified in item 10, "I can determine whether an item is an Asset, Liability or Owners Equity," with a mean of 4.38. Asset, Liability, or Owner's Equity are all part of the accounting equation and are important. According to Bragg (2014), the accounting equation is so important that it is always true - and it forms the basis for all accounting transactions. Everything begins with the basic that may be the foundation of a student's confidence.

Table 1.2 *Level of Accounting Management Efficacy Inventory in terms of Analyzing Information*

ITEMS	Mean	Descriptive Equivalent
I can determine the accounting events and transactions that need to be recorded.	3.66	Much confidence

Table 1.2 *Level of Accounting Management Efficacy Inventory in terms of Analyzing Information (cont.)*

ITEMS	Mean	Descriptive Equivalent
I can locate errors in recording.	3.42	Moderate confidence
I can identify basic standards and principles that underlie accounting information.	3.50	Moderate confidence
I can make a critical analysis of simple cases and problems.	3.39	Moderate confidence
I can easily understand the accounting theories in our lessons.	3.55	Much confidence
I can recognize typical corporate transactions.	3.36	Moderate confidence
I can determine a sole proprietorship, partnership, and corporation.	4.23	Much confidence
I can recognize typical corporate transactions, including authorization, sale, and subscription of shares, treasury shares, dividends, and reserves.	3.46	Moderate confidence
I can identify transactions that should be debited or credited.	4.12	Much confidence
I can determine whether an item is an Asset, Liability, or Owners Equity.	4.38	Much confidence
OVERALL	3.71	Much confidence

The third dimension, Presenting Information, out of 10 items, 7 items are described as much confidence, which means that students have much confidence that they are performing well in that particular accounting field. The remaining three items are all interpreted as moderate confidence. The overall mean of the third dimension is 3.62, described as much confidence.

Table 1.3 *Level of Accounting Management Efficacy Inventory in terms of Presenting Information*

ITEMS	Mean	Descriptive Equivalent
I can classify and summarize the transactions and to prepare data for basic Financial Statements.	3.89	Much confidence
I can make adjusting entries.	3.53	Much confidence
I can prepare a basic Financial Statement.	3.96	Much confidence
I can apply the generally accepted accounting principles to problem-solving involving financial statements.	3.60	Much confidence

Level of Accounting Management Efficacy Inventory in terms of Presenting Information (cont.)

ITEMS	Mean	Descriptive Equivalent
I can use and apply accounting concepts.	3.70	Much confidence
I can integrate and apply knowledge in accounting to a real business situation.	3.80	Much confidence
I have less trouble reporting assigned accounting problems in class.	3.29	Moderate confidence
I can employ the different methods of distributing partnership profit and loss.	3.51	Much confidence
I can compute the book value per share and basic earnings per share.	3.43	Moderate confidence
I can apply the appropriate technology needed in the practice of the accounting profession.	3.49	Moderate confidence
OVERALL	3.62	Much confidence

In the last dimension, Collaborating Around Information, the lowest level is identified in item 2, "I can do accounting tutorials," with a mean of 2.88, described as moderate confidence. As Palfreyman (2008) stated, tutorials are an aid to your degree studies and are meant to complement rather than replace lectures. But it requires great confidence and knowledge to be able to do tutorials with co-students. The remaining items have a mean that ranges from 3.56-4.03 and are interpreted as much confidence. This means that students have much confidence that they perform well in that particular field of accounting management. This last construct has an overall mean of 3.55, described as much confidence. The level of the Accounting Management Efficacy Inventory (AMEI) is 3.61, described as much confidence.

Reliability

The next attribute of a scale that is examined in this research is reliability. As defined by McLeod (2007), reliability refers to the internal consistency of the scale. There are several reliability measures, but in this research, Cronbach's Alpha was used to determine the reliability of each item of the Accounting Management Efficacy Inventory (AMEI). Cronbach's alpha is a useful and flexible tool that one can use to investigate the language test results' reliability. It is used to measure the internal consistency of the items. If the reliability coefficient is more than 0.7, it is considered acceptable (Nunally, 1978). Thus,

Table 1.4 *Level of Accounting Management Efficacy Inventory in terms of Collaborating Information*

ITEMS	Mean	Descriptive Equivalent
I can share my knowledge in accounting during group discussions.	3.71	Much confidence
I can do accounting tutorials.	2.88	Moderate confidence
I enjoy answering accounting problems in a group.	3.87	Much confidence
I can work with others to better understand our topics and lessons in accounting.	3.91	Much confidence
During group discussions, I can defend my points of view.	3.58	Much confidence
I can help others to understand and learn about accounting concepts.	3.54	Much confidence
I can open my mind to difficult interpretations, explanations, or answers about accounting lessons we are studying.	3.57	Much confidence
I can force myself to rethink my viewpoints to compare them with that of others.	3.56	Much confidence
I can reconstruct my understanding of our accounting topics through the different information I have gained from others.	3.64	Much confidence
Through joining group discussions, I can learn and create new knowledge.	4.03	Much confidence
OVERALL	3.55	Much confidence

items with less than 0.7 are considered questionable or unacceptable. Results are presented in Table 2. For the items of the first construct, Retrieving Information, nine (9) out of ten (10) items have a reliability coefficient of .958, and the remaining item has a reliability coefficient of .959. The interpretation for all the items' internal consistency is excellent. In the second dimension, Analyzing Information, two (2) items have a reliability coefficient of .959, and the remaining eight items have .958; all are excellent. All items of the third dimension, Presenting Information, have a reliability coefficient of .958, excellent is the internal consistency interpretation. For the fourth dimension, Collaborating Around Information, the reliability coefficient of the items lies between .957 and .959, which means excellent, just like the previous items. All the items' reliability coefficient of Accounting Management Efficacy Inventory (AMEI) which is

excellent for.957-.959. All items have a reliability coefficient that is more items' reliability coefficient, therefore, reliable.

Table 2.1 *Reliability Indices Per Item of Retrieving Information*

Retrieving Information	Cronbach's Alpha	Interpretation
I can retain the knowledge I acquired from reading the current accounting textbook.	.959	Excellent
I can retain what I have learned in accounting.	.958	Excellent
I can easily recall accounting lessons than other subject's lessons.	.958	Excellent
I can recall and relate past lessons to the current lesson.	.958	Excellent
I can answer problems from past lectures.	.958	Excellent
I can recall what I have learned through remembering my own constructed summaries of it.	.958	Excellent
I can immediately remember our lessons by picturing out its given sample problems.	.958	Excellent
I can recall past learning in accounting through meaningful knowledge management I had created.	.958	Excellent
I can still remember information related to accounting that was already accumulated in my brain.	.958	Excellent
I can easily retain information created through dual coding (creating visual and verbal memory).	.958	Excellent

Table 2.2 *Reliability Indices Per Item of Analyzing Information*

Analyzing Information	Cronbach's Alpha	Interpretation
I can determine the accounting events and transactions that need to be recorded.	.958	Excellent
I can locate errors in recording.	.958	Excellent
I can identify basic standards and principles that underlie accounting information.	.958	Excellent
I can make a critical analysis of simple cases and problems.	.958	Excellent
I can easily understand the accounting theories in our lessons.	.958	Excellent
I can recognize typical corporate transactions.	.958	Excellent

Table 2.2 *Reliability Indices Per Item of Analyzing Information (cont.)*

I can determine a sole proprietorship, partnership, and corporation.	.959	Excellent
I can recognize typical corporate transactions, including authorization, sale, and subscription of shares, treasury shares, dividends, and reserves.	.959	Excellent
I can identify transactions that should be debited or credited.	.958	Excellent
I can determine whether an item is an Asset, Liability, or Owners Equity.	.958	Excellent

Table 2.3 *Reliability Indices Per Item of Presenting Information*

Presenting Information	Cronbach's Alpha	Interpretation
I can classify and summarize the transactions and to prepare data for basic Financial Statements.	.958	Excellent
I can make adjusting entries.	.958	Excellent
I can prepare a basic Financial Statement.	.958	Excellent
I can apply the generally accepted accounting principles to problem-solving involving financial statements.	.958	Excellent
I can use and apply accounting concepts.	.958	Excellent
I can integrate and apply knowledge in accounting to the real business situation.	.958	Excellent
I have less trouble reporting assigned accounting problems in class.	.958	Excellent
I can employ the different methods of distributing partnership profit and loss.	.958	Excellent
I can compute the book value per share and basic earnings per share.	.958	Excellent
I can apply the appropriate technology needed in the practice of the accounting profession.	.958	Excellent

Table 2.4 *Reliability Indices Per Item of Collaborating Around Information*

Collaborating Around Information	Cronbach's Alpha	Interpretation
I can share my knowledge in accounting during group discussions.	.958	Excellent
I can do accounting tutorials.	.959	Excellent
I enjoy answering accounting problems in a group.	.958	Excellent
I can work with others to better understand our topics and lessons in accounting.	.958	Excellent
During group discussions, I can defend my points of view.	.958	Excellent
I can help others to understand and learn about accounting concepts.	.957	Excellent
I can open my mind to difficult interpretations, explanations, or answers about accounting lessons we are studying.	.958	Excellent
I can force myself to rethink my viewpoints to compare them with that of others.	.958	Excellent
I can reconstruct my understanding of our accounting topics through the different information I have gained from others.	.958	Excellent
Through joining group discussions, I can learn and create new knowledge.	.959	Excellent

Collinearity

To determine the construct validity of the dimensions, collinearity diagnostics was done on the four constructs' items as presented in Table 3. According to Dallal (2001), collinearity means just that--an exact linear relationship between variables. It occurs when two predictor variables in a multiple regression have a non-zero correlation (Baguley, 2012). To carry this out, the tolerance and variance inflation factors were utilized. Tolerance values less than 0.1 implies extreme collinearity (Kline, 2013). Thus, items with a tolerance less than 0.1 are invalid. For VIF or variance inflation factor is merely the reciprocal of tolerance (Baguley, 2012). For construct 1, tolerance of its items ranges from .51 to .66. As stated in the paragraph above, tolerance values more than .1 are valid. All the first construct items have more than .1 tolerance values; thus, all the items are valid. The Variance Inflation Factor (VIF) of the items falls between 1.51, the lowest, and

1.95, the highest. Variance Inflation Factor (VIF) that is less than ten is considered valid. Therefore, all the items of the dimensions are valid.

Table 3.1. *Collinearity Indices Per Item of Construct 1*

Construct 1: Retrieving information	Tolerance	Variance Inflation Factor	Validity
I can retain the knowledge I acquired from reading the current accounting textbook.	.66	1.51	valid
I can retain what I have learned in accounting.	.58	1.71	valid
I can easily recall accounting lessons than other subject's lessons.	.57	1.76	valid
I can recall and relate past lessons to the current lesson.	.56	1.78	valid
I can answer problems from past lectures.	.53	1.90	valid
I can recall what I have learned through remembering my own constructed summaries of it.	.57	1.76	valid
I can immediately remember our lessons by picturing out its given sample problems.	.52	1.91	valid
I can recall past learning in accounting through meaningful knowledge management I had created.	.51	1.95	valid
I can still remember information related to accounting that was already accumulated in my brain.	.53	1.89	valid
I can easily retain information created through dual coding (creating visual and verbal memory).	.64	1.57	valid

For construct 2, Analyzing Information, the tolerance value of the items falls between .44 and .66. Simultaneously, the Variance Inflation Factor (VIF) of the items ranges from 1.51 to 2.28. The tolerance value and Variance Inflation Factor (VIF) of each item satisfied the standards and rules set. All items under this construct are valid.

Table 3.2. *Collinearity Indices Per Item of Construct 2*

Construct 2: Analyzing Information	Tolerance	Variance Inflation Factor	Validity
I can determine the accounting events and transactions that need to be recorded.	.44	2.28	valid
I can locate errors in recording.	.52	1.94	valid
I can identify basic standards and principles that underlie accounting information.	.66	1.51	valid
I can make a critical analysis of simple cases and problems.	.49	2.03	valid
I can easily understand the accounting theories in our lessons.	.52	1.92	valid
I can recognize typical corporate transactions.	.47	2.14	valid
I can determine a sole proprietorship, partnership, and corporation.	.60	1.67	valid
I can recognize typical corporate transactions, including authorization, sale, and subscription of shares, treasury shares, dividends, and reserves.	.63	1.60	valid
I can identify transactions that should be debited or credited.	.49	2.04	valid
I can determine whether an item is an Asset, Liability, or Owners Equity.	.66	1.52	valid

The tolerance value of the items in construct 3 lies between .43 and .59. The values are greater than .1, so they are considered valid. The Variance Inflation Factor (VIF) of this construct ranges from 1.51 to 2.28. The Variance Inflation Factor (VIF) of the items does not exceed 10. All these items of construct 3 are valid.

Table 3.3. *Collinearity Indices Per Item of Construct 3*

Construct 3: Presenting Information	Tolerance	Variance Inflation Factor	Validity
I can classify and summarize the transactions and to prepare data for basic Financial Statements.	.49	2.03	valid
I can make adjusting entries.	.49	2.04	valid
I can prepare a basic Financial Statement.	.50	2.02	valid
I can apply the generally accepted accounting principles to problem-solving involving financial statements.	.43	2.31	valid
I can use and apply accounting concepts.	.46	2.17	valid
I can integrate and apply knowledge in accounting to the real business situation.	.53	1.87	valid
I have less trouble reporting assigned accounting problems in class.	.56	1.78	valid
I can employ the different methods of distributing partnership profit and loss.	.51	1.97	valid
I can compute the book value per share and basic earnings per share.	.59	1.71	valid
I can apply the appropriate technology needed in the practice of the accounting profession.	.57	1.77	valid

For the fourth and last construct, Collaborating Around Information, its items' tolerance value lies between .42, the lowest, and .70, the highest value. The tolerance values exceed .1. Therefore, these items are valid. The Variance Inflation Factor (VIF) of the items are valid for the values to fall between 1.43 and 2.36. The items of the fourth construct are also valid.

The tolerance value and Variance Inflation Factor (VIF) of all items of the Accounting Management Efficacy Inventory (AMEI) dimensions are greater than .1 and less than ten, respectively. The results proved that all items are valid.

Table 3.4. *Collinearity Indices Per Item of Construct 4*

Construct 4: Collaborating Around Information	Tolerance	Variance Inflation Factor	Validity
I can share my knowledge in accounting during group discussions.	.57	1.76	valid
I can do accounting tutorials.	.70	1.43	valid
I enjoy answering accounting problems in a group.	.55	1.83	valid
I can work with others to better understand our topics and lessons in accounting.	.54	1.86	valid
During group discussions, I can defend my points of view.	.48	2.10	valid
I can help others to understand and learn about accounting concepts.	.42	2.36	valid
I can open my mind to difficult interpretations, explanations, or answers about accounting lessons we are studying.	.44	2.30	valid
I can force myself to rethink my viewpoints to compare them with that of others.	.49	2.05	valid
I can reconstruct my understanding of our accounting topics through the different information I have gained from others.	.49	2.03	valid
Through joining group discussions, I can learn and create new knowledge.	.62	1.63	valid

CONCLUSIONS AND RECOMMENDATION

The study's main purpose was to develop an Accounting Management Efficacy Inventory for Accounting Majors in UM Digos College. This study used the quantitative method of research. Numerical data reflecting the efficacy of

Accounting Majors were gathered and used to verify and check the inventory's dimensions and corresponding test items. Data were collected from the 194 selected participants from the first year to fourth year Accounting Majors in UM Digos College enrolled in the first semester SY 2015-2016. The sample consisted of 140 females and 54 males with an average age of 18.36. Demographic data collected included name, age, sex, year, and section. The researchers used an expert validated survey questionnaire composed of four (4) dimensions and ten(10) test items for each dimension. The statistical tools utilized were Mean, Cronbach's Alpha, Collinearity.

It was known that the level of Accounting Management Efficacy Inventory (AMEI) has an overall mean of 3.61, described as much confidence. This means that students have much confidence that they can perform well in that particular accounting management field. The level of the first dimension is described as much confidence. The second dimension's level means that the students have much confidence. On the third dimension, the level is also described as much confidence.

Furthermore, the last construct's level is described as much confidence. On the other hand, all the Accounting Management Efficacy Inventory (AMEI) indices fall between .957-.959 and have satisfied the standard reliability coefficient. Thus, all are acceptable and therefore reliable. Lastly, the validity of the Accounting Management Efficacy Inventory (AMEI) using collinearity dictates that all items are valid.

Based on the results and conclusions drawn, the researchers recommend the following: (1) the current administration may use this study to test the students' confidence. They would be able to know what subjects to strengthen and give focus to that would greatly affect students' efficacy in accounting management, (2) accounting students may use Accounting Management Efficacy Inventory (AMEI) to assess if they are confident enough on how they manage to account and thereby improve them, (3) professors of any accounting courses may use this inventory to discern the confidence of their students in managing to account. This will help them create new and diverse teaching strategies. (4) for colleges or universities, they may include Accounting Management Efficacy Inventory (AMEI) to test the confidence of their future students who want to take up any accounting courses, and (5) future researchers may use this study as a reference basis for their study or any related researches.

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