

Extension of Business Analysis Guideline – BABOK V3 for the Nepalese Context

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Abstract— Business Analysis (BA) is a critical and significant success aspect of software projects. BABOK V3 guide considered as a standard book that provides description of tasks, skills and techniques that a business analyst requires to work efficiently.

This exploratory study is conducted with the aim of proposing an extension of current version of BABOK in the context of Nepal. Fourteen vacancies reviewed from official websites showed potential variance against the current version of BABOK, which are namely quality assurance of the software and support after release. Two hundred and forty-one Nepalese software engineers working in software companies in Nepal has participated in the study. Data were collected through online survey method. Spearman correlation and binary logistic regression were used to determine the efficiency BAs' involvement in testing and change resistance.

The study results show that when change resistance management is introduced it improves the change strategy, analysing potential values and, solution recommendation respectively. Most of the respondents stated behavioural approach to be most efficient to address resistance to change. Additionally, introduction of testing techniques has positive impact on reducing solution limitation and thereby, improving the outcome of solution performance analysis as well. Further analysis has determined black box testing to be positive predictor to improve solution value.

Hence, extension of current version of BABOK guideline is required to enhance productivity of business analyst.

Keywords— Requirement Engineering, Business Analysis, BABOK V3 Guideline Improvement, Software Testing, Change Resistance

I. INTRODUCTION

Requirement's description describes the reason for a system to be desired, based on existing or forecasted settings which may be inner processes or an outward environment [1]. Requirement engineering is a crucial process in determining the capabilities of new software products. Therefore, it has become an integral part of software development process. It helps to develop various high-quality software requirement documents such as functional requirement document, software requirement document, interface requirement document and non-functional requirement document[2]. Software requirement specification commonly refers to all these documents.

Business analyst acts as a bridge between different stakeholders to handle requirement-engineering tasks. They are often required to verify the accuracy of software based on gathered business requirements. They are also required to deal with stakeholders at different stages of the software development including the implementation phase. There are many BA standard and guidelines available in market however BABOK V3 is one of the most comprehensive guidelines[3].

The current version of the guideline has incorporated six knowledge areas along with its tasks [4]. It has also defined change strategy; however, has not outlined the tasks and techniques required for managing change resistances and software testing that need to be performed by business analyst.

The guideline must support business analyst by providing necessary tools and techniques to deal with the change resistance they often face during their work. Therefore, the present study was conducted with the aim to propose the extension of BABOK Guideline V3 in context of Nepal.

II. RELATED THEORIES

A. IIBA's BABOK V3 GUIDELINE

IIBA's BABOK V3 provides six knowledge areas for business analysis process. Knowledge areas characterize exact business analysis proficiencies that incorporate several sub-areas also known as task. The six knowledge areas are as follows [4]:

1) Business analysis planning and monitoring:

This knowledge area depicts the way to specify the tasks important to carry out a comprehensive business analysis. This knowledge area includes procedure and techniques to recognize key stakeholders, manage requirements, techniques for BA process and governing mechanism to track and control necessary changes.

2) Elicitation and Collaboration:

Business analysts perform different tasks and uses tools and techniques to acquire information from diverse stakeholders and verify them. It is a critical knowledge area to gather key requirements. Collaboration represents the co-ordination between different stakeholders working together to identify and negotiate business information using different techniques such as survey, interviews, workshops, focus groups, observation, and process

analysis etc. According to BABOK V3, elicitation and collaboration is never a stage, rather it is an ongoing process in business analysis

3) *Requirements of life cycle Management:*

The initiation and conclusion of requirement information and maintenance is handle using different tasks in Requirement of life cycle management knowledge area.

4) *Strategy Analysis:*

Strategy analysis signifies the tasks that are essential for the goal achievement plan. It analyses the vision, aim of the business, and recognizes the state that stakeholders want to be after the completion of process.

5) *Requirement Analysis and Design Definition:*

This knowledge area describes works to perform, to manage, identify, and analyse alternative potential solution, validate, and verify the requirement information, model the requirements discovered from elicitation and collaboration process.

6) *Solution Evaluation:*

This knowledge area covers the tasks that are critical for the success of any project and is done to ensure all requirements are fulfilled, planned values are realized and offering optimal performance.

B. *Change Resistance Management Technique*

It is a systematic process to deal with a change which includes various aspects such as coordinating resources, applying tools, and managing knowledge for organizational success [8].

Some common approaches to handle the change and resulting resistances are:- [5].

1) *Behaviour Approach:*

It uses reward and punishment technique to motivate individuals to change. It deals with different sub techniques such as performance management, rewarding system, feedback management, and such.

2) *Cognitive Approach:*

It works by setting goals and the result-based coaching to make the change happen.

3) *Psychodynamic Approach:*

When software development and implementation take place, the stakeholders go through a psychological process due to the changes takes place as accordance to the change strategy. Here the psychodynamic approach enables the handing of change resistance by dynamically addressing the different factors causing the resistance. In these approaches, the change resistance group are handled by addressing their emotion, understanding them, and counselling them.

4) *Humanistic Approach:*

In this approach, the resistance to change is handled using communication and consultation, developing values and culture, and addressing the emotion of change resistance group.

C. *Software Testing Techniques*

Software testing is a process of executing system to determine error. It should be applied in all the phase of software development life cycle from the requirements elicitation phase of software development to when the

product is ready for installation or shipping, following a successful system test [6]. The main purpose of software testing is to identify defects while developing software along with providing information about the level of quality to ensure that software meets the specified requirements [7].

There are several methods to perform software testing by business analysts. Different techniques provide various option for quality assurance focusing on different quality factors such as usability, security, capability, portability, maintainability, reliability and so on [8]. Some of the fundamental and famous software testing techniques are as follows:

- 1) White Box Testing
- 2) Black Box Testing
- 3) Non-Functional Testing
- 4) Acceptance Testing
- 5) Usability Testing

D. *Spearman's Correlation Rank Coefficient*

Spearman's correlation coefficient measures the strength and direction of monotonic relationship between two variables. It is denoted by ρ [9], [10].

Assumptions for Spearman's Correlation:

- Relationship between two variables is nonlinear.
- Variables measured are at least ordinal.
- One of the variables not following normal distribution.

Its value ranges from +1 to -1.

$$\rho = 1 - \frac{6 \sum_i d^2}{n(n^2-1)} \quad \text{Eq 1. Formula for calculating Spearman's Correlation}$$

Where $d_i = R1_i - R2_i$

$R1_i$ = rank of i in the first set of data

$R2_i$ = rank of i in the second set of data and

n = number of pairs of observations

E. *Binary Logistic Regression*

When the dependent variable is dichotomous, for predictive analysis it is appropriate to conduct regression analysis. It is used to describe data and to explain the relationship between one dependent dichotomous variable and one or more nominal, ordinal, interval, or ratio-level independent variables[11]–[14].

It gives the information about measures of how relevant an independent variable is and signifies the direction of the relationship either positive or negative.

$$P = \frac{\exp(a+b_1x_1+b_2x_2+\dots)}{1+\exp(a+b_1x_1+b_2x_2+\dots)} \quad \text{Eq 2. Formula for calculating Binary Logistic Regression}$$

for calculating Binary Logistic Regression

Where:

P =the probability that a case is in a particular category,

B - This is the value for the logistic regression equation for predicting the dependent variable from the independent variable. They are in log-odds units. It is calculated using the formula

$$\text{Log}(p/1-p) = b_0 + b_1x_1 + b_2x_2 + \dots \quad \text{Eq 3. Formula for calculating B value}$$

Where p is the probability

Exp (B) - it indicates that for every, one unit increase in independent variable, it is expected to change as much as the value of Exp (B) in dependent variable.

F. Cronbach's Alpha

Cronbach's alpha is a convenient test used to estimate the reliability, or internal consistency, of a composite score [15].

$$\alpha = \left(\frac{k}{k-1} \right) \left(1 - \frac{\sum_{i=1}^k \sigma_{yi}^2}{\sigma_x^2} \right) \quad \text{Eq 4. Formula for calculating Cronbach's Alpha}$$

Where:

k refers to the number of scales items

σ_{yi}^2 refers to the variance associated with item i

σ_x^2 refers to the variance associated with the observed total scores

The resulting α coefficient of reliability ranges from 0 to 1 in providing overall assessment of a measure's reliability.

III. RELATED WORKS

A. Role of Business Analyst

An exploratory study conducted in Australia determined that business analysts were primarily employed to undertake the activities articulated in the BABOK. However, the study identified not all part of the BABOK were equally important. It also identified that some skills and competencies that were highly considered by business analyst were not included in BABOK which were namely project management, implementation, technical skills, data management, and testing. This study also revealed an increasing emphasis on AGILE and Business rather than Technical Analysis. The study has also suggested for integrated extension for improvement of core BABOK[16].

B. Role Of Business Analyst in Nepal

Based on the review fourteen vacancy in the job portals and the website, business analysts were also responsible for assuring the quality of the solution and maintaining relation with client during and after the implementation of the system and all of these were not addressed in the current version of BABOK guideline [17-31/have to make reference of secondary data].

C. BABOK Knowledge Area

An exploratory study conducted in Australia determined unequal importance of BABOK knowledge. The study result identified most of the advertisement (57%) included elicitation and collaboration knowledge area followed by requirement analysis and design definition accounting 26% and strategy analysis with 17%. The study also identified that 25% of the reviewed had not mentioned any BABOK knowledge at all [16].

D. BABOK Tasks

Results of the exploratory study conducted in Australia identified conduction of elicitation and managing stakeholder collaboration were the frequently mentioned individual task type within the most frequently referenced

knowledge areas of BABOK accounting 57% and 31% respectively in the reviewed advertisements [16].

IV. RESEARCH HYPOTHESIS

A. Research Hypothesis

TABLE I
Research Hypothesis

S.N.	Research Hypothesis
H1	If Change Resistance Management is introduced, it improves Change Strategy.
H2	If change resistance management is introduced, it improves Analysing Potential Value and Solution recommendation.
H3	If Change Resistance Management is introduced in business analysis, it improves enterprise assessment to reduce the enterprise limitations.
H4	If Testing techniques is defined, it has positive impact on reducing solution limitations.
H5	If testing techniques is well defined, it has positive impact on Analysing Performance Measure to improve the outcome of Solution Performance Analysis

V. METHODOLOGY

A. Research Approach

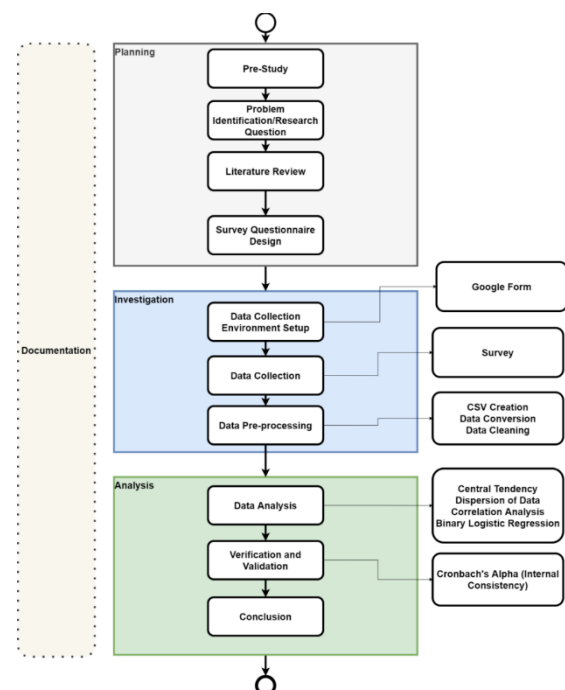


Fig. 1 Research Approach

B. Study population and sampling

A total of 241 Nepalese software engineers working in Nepal participated in the study. The study sample were selected purposively.

C. Data Processing and Analysis

Manual review of fourteen advertisement of business analyst from official website and job portal was conducted. Primary data was collected through google form. The collected data consisted information of demography of the organization, BABOK knowledge areas being implemented, business analysis performance status and extension tasks on existing BABOK standards.

The collected data from Google form were loaded, edited and coded manually in SPSS tool (Statistical package for social science). Data has been summarized using appropriate descriptive statistic such as frequency, mean, standard deviation, and quartile. Spearman's rank correlation was used as test correlation between the variables. The inference was made based at p-value of 0.05 and 95% of CI. Regression analysis was performed using binary logistic regression.

VI. RESULT AND DISCUSSION

About 70 % of the respondents stated that they had 2-10 business analyst engaged in their company. Agile (70%), scrum (38.3%) and waterfall (24.4%) were the three most commonly used software methodology in the organization accounting 70.1%. Majority of the respondent (94.6%) stated that behaviour approach was most efficient approach while in term of software testing technique most of them (36.17%) were involved in acceptance and usability testing respectively.

Table II
Cronbach's Alpha Result

Category	Alpha Obtained Value
Business Analysis Planning and Monitoring	0.865
Requirement life cycle effort	0.907
Planning effort	0.865
Elicitation and collaboration involvement and effort	0.871
Requirement analysis and design definition involvement and effort	0.890
Strategy analysis involvement and effort	0.871

Table III
Summary of study results

Regression	B, Exp (B)	P-Value	Hypothesis Accepted
Binary logistic regression analysis for quality of change strategy	4.696	0.002*	H1
Binary logistic regression analysis for improvement of potential value and solution recommendation	2.971	0.013	H2
Binary logistic regression analysis for occurrence of solution limitation	3.111	0.016	H4
Binary logistic regression analysis for analysing performance measures.	3.111	0.01	H5

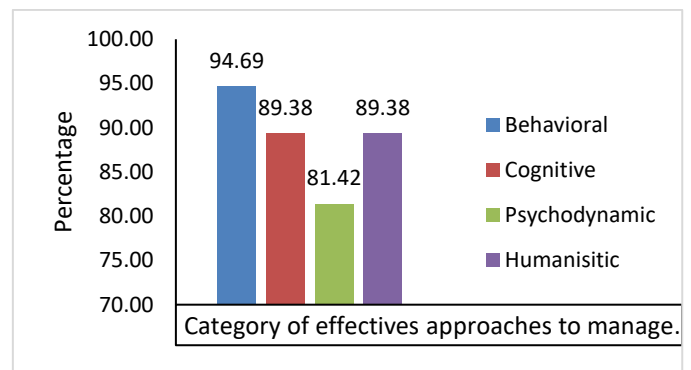


Fig. 2 Category of effective approaches to manage change resistance

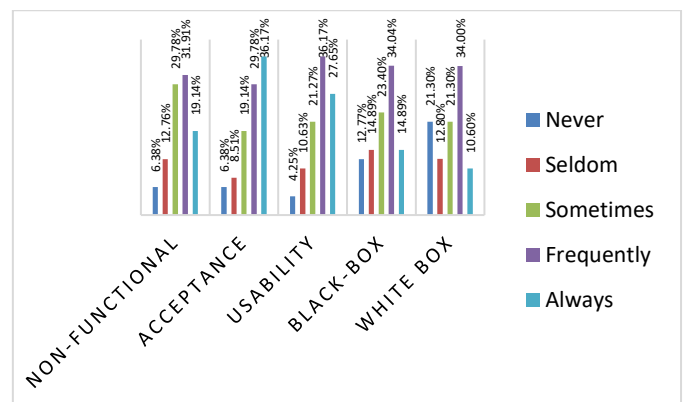


Fig. 3 Involvement of business analyst in different type of software testing

The main objective of this study was to propose the extension of current version of BABOK. The results showed that business analyst were assigned to responsibility which were not incorporated in BABOK namely quality assurance of software and support after release. The results also determined

implementation of change resistance management technique as a positive predictor for quality of change strategy, team performance in analyzing potential value and solution recommendation implying that when change resistance management technique is implemented there is significant improvement in quality of change strategy, team performance in analyzing potential value and solution recommendation respectively. In addition, the result determined solution testing technique as positive predictor of analyzing performance measures along with involvement in black box testing as a positive predictor for the improvement in solution value. The positive response of additional task i.e. change management techniques and software testing in improvement of quality of software development cycle support for the extension of current version of BABOK.

A study conducted in Australia identified that business analyst were assigned with skills and competencies that were not included in BABOK namely project management, technical skills, data management and testing. The study also suggested for integrated extension for improvement of core BABOK[16].

VII. CONCLUSION

Business analyst play a critical role in developing software as per the requirement of the client. They are assigned with multiple responsibilities throughout software development cycle of which some crucial tasks and not covered in standard guideline such as BABOK. Although the current version of BABOK has mention about change resistance management, it has not given the further details. The present study is an inception of determining that implementation of change resistance technique as a positive predictor to improve quality of change strategy, analysing potential value and solution recommendation respectively. Along with implementation of software testing technique specifically black-box testing to be a positive predictor in improving analysing performance measure and thereby improving outcome of solution performance analysis.

TABLE 3

Proposed new task and technique in BABOK knowledge area

#	Knowledge Area	Added Tasks	Proposed New Techniques
1	Strategy Analysis	Change Management	Behavioural Approach
2	Solution Evaluation	Software Testing	Black Box Testing

In information from the study supports the update of current version of BABOK to improve the work done by business analyst and thereby improve software solution quality.

VIII. FUTURE WORK

In future, further study considering other properties of business analysis and software engineering such as software development methodology, use in the organization, team size, and business analyst size in the team and BA experience/expertise need be conducted.

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