E-Assessment of Bi-Weekly Report: A Case Study of National Orientation Agency (NOA), Imo State, Nigeria

[1]Ndunagu Juliana, [2]Agbasonu Val.C., and [3]Ihem Francis C.

[1]National Open University of Nigeria.ng4vicky@yahoo.com +234 803 353 2416
[2]Department of Computer Science, Imo State University. +234 803 872 760
[3]School of Science and Technology, National Open University of Nigeria.fcihem1@yahooo.com,
fcihem2@gmail.com +234 803 587 2847

Abstract

This paper is aimed at developing software for checkmating the problems associated with manual report assessment in organisations that receive reports on regular basis from field officers in different locations. This work would eliminate manual method deficiencies such as time wastage, wrong computation, and lack of database. It would also make report process easier both for the field officers and the assessment officers. The software is user-friendly and interactive. The system design approach used in this research was the System Development Life Cycle (SDLC) model, which employs seven phases of Project Identification and Selection, Project Initiation and Planning, Analysis, Logical Design, Physical Design, Implementation, and Maintenance. The method of data collection was personal interview and published materials. Visual Basic programming language and Microsoft Access were used for the implementation. The major contribution of this work is that it eases report submission, assessment, and feedback collection by exploiting Information Technology effectively.

Keywords: E-assessment, Bi-weekly, Report.

Introduction: Background of the Study

Assessment is an act of evaluating a trainee's level of assimilation of the course being trained. This view was reinforced by Lepi [8] , who stated that "assessments do have value and an important place in our learning structure." Assessment is often focused on determining knowledge. It is important in that, asking trainees to demonstrate their understanding of the subject matter is critical to the learning process. It is important to get the assessment practices right, as the effects of assessment affect the morale and status of the one assessed. Moreover, correct assessment is very vital in an organisation in that it reflects the staff's capabilities, efficiency, and performance.

- **Educational Assessment**

This is the process of documenting usually in measurable terms knowledge, skills, attitudes, and beliefs. Educational Assessment can be done using two methods namely: manual (paper based) method and electronic method.

i. **Manual method**: The manual method of assessment is being controlled by a human assessor not by a machine. This method has some advantages which include:

- It is simple, anybody can assess with it, as it does not require special training.
- It is cheaper on the short-run.
- It requires little or no tool to implement.

Notwithstanding the good aspects, the method has varied disadvantages, which outweigh the advantages and are outlined below:

- Low reliability (human marking is less reliable than machine marking).
- Prone to partiality (the assessor might know the examinee so may favour or make allowances for minor errors).
- Much space for paper storage.

- Time wastage due to duration of assessment process.
- Scarcity of records.
- Higher long-term costs.

ii. **Electronic method**: This study would focus on electronic assessment. Electronic assessment (E-assessment) refers to the use of Information Technology (ICT) to manage and deliver assessment, e-Assessment Association [2]. E-assessment method has the following advantages among others over the Manual method:

- Lower long-term costs.
- Improved reliability (machine marking is more reliable than human marking).
- Improved impartiality (machine marking does not know the examinee, so does not favour nor make allowance for minor errors).
- Greater storage efficiency -tens of thousands of answer scripts can be stored on a server compared to the physical space required for paper scripts.
- Fast submission and assessment of report as well as result.
- Better control over record keeping and files.
- Increased productivity of the employees, because of the hassle free paper work job.
- Security of records with password.
- It ensures correct assessment.

However, E-assessment has some challenges which are outweighed by the gains. E-assessment systems are expensive to establish. Also regular power supply is needed to operate equipment.

The NationalOrientation Agency (NOA) Imo State is a Federal Government parastatal saddled with the responsibility of grassroots' sensitization on government policies and programmes. NOA Imo State had officers at the 27 Local Government Areas of the State, who travelled to State Headquarters at Owerri to submit their Bi-weekly report. The cost of transportation was high as the price of fuel fluctuated sometimes, officers lost man hours as many L. G. As. were located far from Owerri. Also officers faced various risk while travelling, ranging from accidents, robbery, and being stranded as some L. G. As. were located in difficult terrain areas. There was no database of the Bi-weekly report. The Bi-weekly report was manually assessed by Assessment officers. The process of assessment was slow that it resulted in low productivity.

If E-assessment system could be adopted by NOA, its work would be more effective, efficient, accurate, faster, and cheaper with robust database.

Objective of the Study

The specific objectives of this research include the following:

i. To develop a user friendly software for report assessment.

ii. To achieve accuracy in report scoring and computation.

iii. To increase the speed of report submission, assessment, and feedback.

iv. To generate comprehensive and robust database for reports.

v. To reduce cost of report process.

vi. To improve efficiency of staff and effectiveness of the report process.

Statement of the Problem

Manual assessment method has a lot of challenges. NOA, Imo State used it and the following problems existed in the organization's report process:

- **Time wasting**: as man hours are lost during submission, as well a slow report assessment.
- **Inaccuracy**: mistakes made during scoring and computation.
- **Inefficiency and ineffectiveness**: low job performance recorded and stress.

- **Lack of database**: lack of database of Bi-weekly report.
- **High cost**: expensive transportation while submitting report and feedback process.
- **Cumbersome**: report activities were cumbersome.

Literature Review
Theoretical Framework

There are many theories that tried to explain user acceptance of technology, but the one used in this research was Technology Acceptance Model (TAM) developed by Fred Davis in 1989. TAM suggested that when users were presented with a new technology a number of factors influenced their decision about how and when they would use it notably:

- **Perceived Usefulness (PU)** –Davis defined PU as the degree to which a person believed that using a particular system would enhance his job performance.
- **Perceived ease-of-use (PEOU)** – Davis explained this as the degree to which a person believed that using a particular system would be free from effort. Criticisms have been made against TAM which led to modifications of the theory to Unified Theory of Acceptance and Use of Technology (UTAUT), Venkatesh et al [16]. UTAUT tried to explain user intentions to use an information system and subsequent usage behaviour.

Good Assessment

Suskie [14] identified good assessment as that assessment that gives us truthful information. It tells us what our students have truly learnt. Any student who learnt well will do well on a good assessment. The students who did not learn what was taught will not do well on good assessment.

ICT and Cost

Discussing on the positive impacts of ICT on Cost, Adesina [1] opined that ICT made it possible to package and transmit information across the world at a very low cost. In the same vein, Borghoff [4] stated that the network-centred phase we were in induced a decrease in the cost of information, facilitating global activities for an increasing number of firms. In other words, the cost of information dissemination has been reduced to a large extent through the adoption of ICT. Commenting also on the advantages of ICT, Wang et al [17] opined that to save time and cut cost, decision makers should focus more on ICT utilization and business process redesign.

ICT and Efficiency/Effectiveness

Commenting on the gains of ICT, Open (11) identified the following:

- Promotion and enhancement of overall operational efficiency and
- Improvement in procurement efficiency, effectiveness and transparency.

Buttressing the above position, Blaine & Roche [3:] posited that the efficiency of the external marketplace was affected by ICT. This implies that ICT enhances efficiency and effectiveness in a process.

On the contrary, Pillar [12] argued against the positive influence of ICT on efficiency by pointing to the negative effects of the increasing amount of information to be processed ('information overload') and organizational interdependencies (boundary-spanning problems). In the same vein, Borghoff[4] held that ICT could be a basis for the development of strategic success factors by enhancing product utility or organizational innovation and efficiency but does not constitute a competitive advantage per ser. This means that in itself ICT does not translate to greater efficiency.

Granted ICT in itself did not translate to efficiency/effectiveness, its proper usage makes operations easier and as such translates to more operations. Under this study we would see how automated report assessment made the operation easier and led to greater job **potential.**

Pointing out the positive impact of ICT on accuracy, Open [11] stated that some in-house applications were developed to enhance the accuracy of the office's various business

processes. Corroborating the above view about ICT positive effect on accuracy Wang [17] held that machines were capable of producing the same standard of product over and over again, which reduces human error and therefore reducing waste or error.

To corroborate the view above, I would say automation leads to standardization of products or services which ultimately reduces substandard products and errors. The software produced for this study would ensure correct report scoring and computation each time the operation is carried out, thereby eliminating suspicion associated with manual scoring and computation.

ICT and Speed

Commenting on ICT and Speed, Wang [17] opined that with adoption of ICT, production should be increased as some activities will be speeded up. In like manner, Samii [13] held that the network-centred phase brought by ICT resulted in increase in the speed and volume of communication, both internally and externally, making coordination of globally dispersed activities much easier. Also attesting to ICT positive impact on Speed, Open [11] asserted that E-procurement practices and procedures resulted in reduction in time which included cycle time, transaction time, and administrative time.

Expressing a contrary view on ICT and Speed, Ugwuegbulam[15] opined that ICT effect on Speed has a number of negative effects which include unemployment and dehumanization, laziness, and reduction of manual capacity. Elucidating on these, he said a task that may require 200 people to achieve in 1 month can be achieved within 1 hour if the system is automated. By so doing, only a few ICT staff, say about 2 people are required to achieve the task that required 200 people. The rest 198 people would have their job put on the line, thus resulting in unemployment and dehumanization. In terms of laziness, a task that ordinarily would take much time would be done within an insignificant period of time if the process is automated, the operator would have the rest of the time to engage in things which may not be productive. On the aspect of reduction of manual capacity, a person who uses automated system would find it hard to revert to manual effort or lose some of his efficiencies prior to automation, by so doing he would start diminishing in his manual capacity and human efficiency.

While I support ICT great impact on speed. It is important to note that adequate control measures need to be put in place in order to put the unutilised time into productive use and people put out of work should be given alternative things to do or be retrained so that they can cue into the automated process in other to achieve better economies of scale. Because of the fastness of E-Assessment system ample time is saved from travelling to submit report to and fro L.G.As. offices to State Headquarters, equally assessment took lesser time.

Methodology

Software Development Life Cycle (SDLC) Approach of System Development There are many information systems design approaches, but the one used in this research was the SDLC model. SDLC model is a model that employs seven phases of Project Identification and Selection, Project Initiation and Planning, Analysis, Logical Design, Physical Design, Implementation and Maintenance. This model can be illustrated diagrammatically as follows:
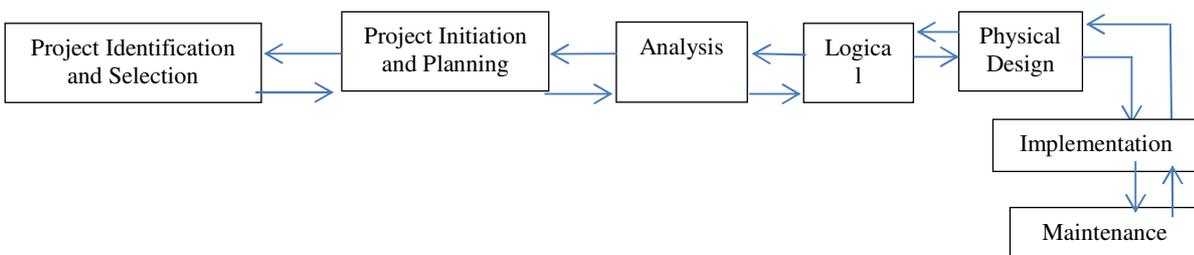

Fig 1: Phases of System Development Life Cycle (SDLC) (Source: Advanced Systems Analysis and Design by Nwaocha, 2009)

- Project Identification and Selection:
- Project Initiation and Planning:
- Analysis:
- Logical Design:
- Physical Design:
- Implementation:
- Maintenance:

Following this approach, a design was made and implemented using Visual Basic 6.0 programming language and other tools.

Report Program Modules

In a report system different activities take place. In this program for the application design, these activities were divided into different modules. The activities include: process, submission and assessed.

Report System → Process Report → Report Submission → Reports Assessed

Fig 2: Report Program Modules indicating

Report assessment process

From the above figure, Process Report is taken first, followed by Report Submission and lastly Reports Assessed.

System Analysis of the E-Assessment

To produce a workable E-assessment system, one must first analyse what is on ground, and further look into the parameters needed for the software to be functional. The requirement analyses of this work surveyed among other things are as follows:

- The ability of the software to accept user inputs (report details).
- Ability to make use of the supplied parameters from score and compute accurately and grade reports automatically.

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- Ability to assess reports faster than manual method.
- Ability to improve staff efficiency and effectiveness.

Database Specification

The table containing the input data is described below using MS Access database format. The table columns are defined with the following attributes: Field Name, Field Type, and Description. Below are the structures of the Table

Table1: Report Table

Field	Field type	Description
Report ID	Auto number	The report ID no
Month	Text	The month report is submitted
Report Type	Text	The report's title
LGA Name	Text	The LGA name
Subject	Text	The subject of the report
Date Submitted	Date/Time	Date of submitting report
COMO Name	Text	The NOA LGA officer's name
COMO Phone no	Auto number	NOA officer's phone no
Assessment officer	Text	The name of the assessment officer
Date Assessed	Date/Time	Date report is assessed
No of Basic Terms	Auto number	No of Basic terms in a Section

System Design

Following the detailed analysis made, a model design for the e-assessment was made
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and in turn implemented. Shown below are the sampledesign of the different modules that constitute the authoring software

PROCESS REPORT FORM	
WELCOME TO NOA E-ASSESSMENT FOR BI-WEEKLY REPORT PLEASE TYPE IN THE SECTION NUMBER, NUMBER OF BASIC TERMS CONTAINED IN THE SECTIONS, AND OTHERS HERE. NOTE: INPUT THE NO OF BASIC TERMS BEFORE CHECKING TO AVOID ABORTING THE PROGRAM	
REPORTID: LGA NAME: MONTH: REPORTTYPE: SUBJECT: COMONAME: COMOPHONENO: ASSESS. OFFICER: DATE ASSESSED:	NO OF BASIC TERMS SCORES REMARKS SECTION ONE RATING: ⊙ SECTION ONE RATING: ⊙ SECTION ONE RATING: ⊙ SECTION ONE RATING: ⊙ SECTION ONE RATING: ⊙ SECTION ONE RATING: ⊙ SECTION ONE RATING: ⊙ SECTION ONE RATING: ⊙ SECTION ONE RATING: ⊙ TOTAL SCORE : ⊙

Fig. 3: The Form Design for Process report. With this form the Assessor supplies Report ID, LGA Name, No of Basic Terms, etc. Then the system scores, computes, and grades the reportautomatically.

REPORT SUBMISSION FORM	X	

REPORT SUBMISSION

DATE SUBMITTED:

REPORT TYPE: ○MID MONTH   ○MONTH END

SUBMISSION DETAILS:

ADDNE	CLEA	RETUR	PRINT	ALL REPORTS ASSESSED	EXIT

Fig. 4: The Form Design for Report submission. With this form the Assessor supplies Date submitted, and Report type. Then the System displays submission details automatically**.**

ALL REPORTS ASSESSED FORM	X	

ALL REPORTS ASSESSED

CLEA	RETUR	PRINT	EXIT

Fig. 5: The Form Design for All Reports assessed. With this form the System displays the database of All Reports assessed automatically.

After the design, it was coded using Visual Basic 6.0 and integrating Microsoft Access at the back end. The Home interface of the e-:

assessment system is as shown in the figure below
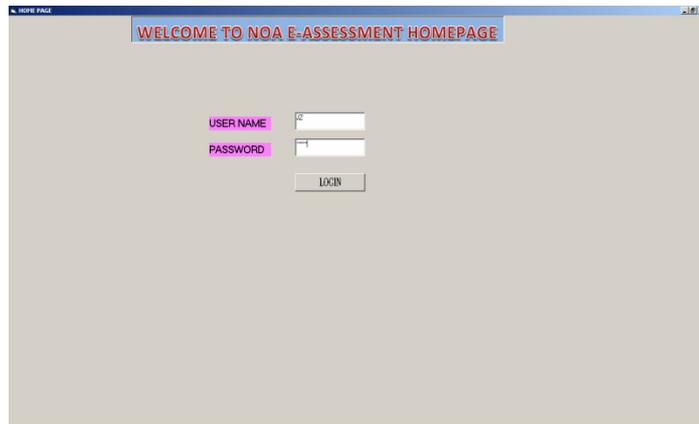
Fig. 6: The Home Interface/Authentication Form of the E-assessment Software.

The home interface enables the new user to gain access into the software. A user must be authenticated by supplying valid Username and Password to gain access to do any of the following: assess new report, generate submission details or preview/print database of all reports assessed.

After authentication, the system will now load for you the Process Report Interface where you can perform assessment operations on each Report. Shown below is the Process Report Interface

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Fig. 7: The Process Report Interface. Other interfaces in E-assessment are shown in the figures below:
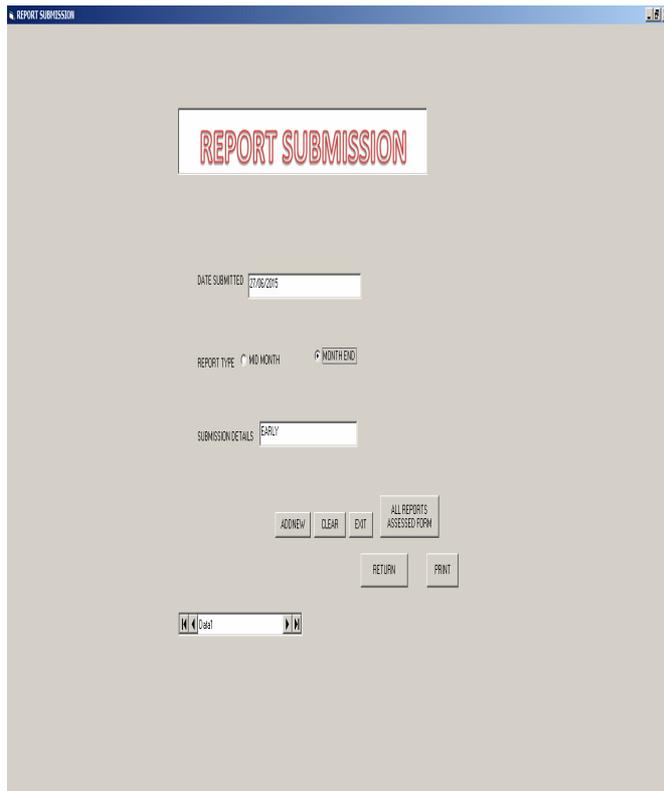
Fig.8: The Report Submission Interface.

The Report Submission Interface enables the user to manage and monitor report submission.
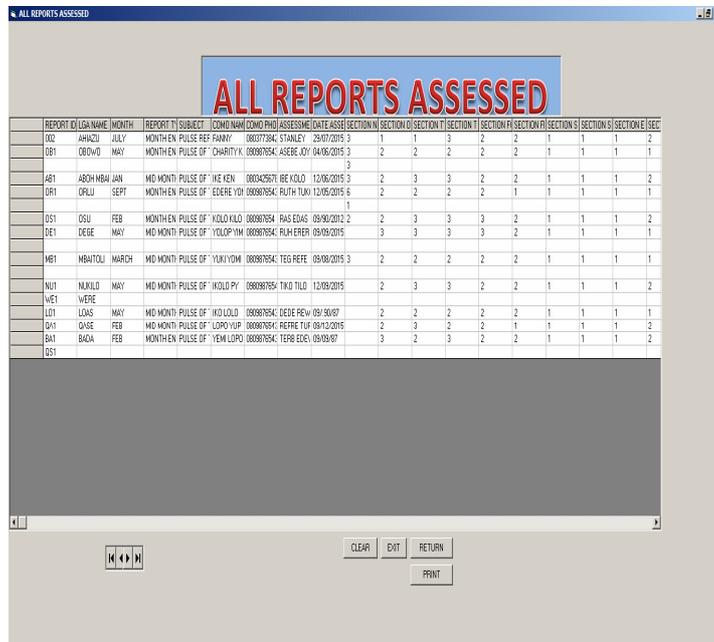
Fig. 9: The All Reports Assessed Interface.

The All Reports Assessed Interface enables the user to preview or print database of all reports assessed.

3.4 Research Findings

We now highlight the findings made at the end of this research work.

   i.   User friendly software was developed for report assessment.
   ii. Report assessment was automated.
   iii. Report scoring and computation were accurate.
   iv. Report submission, assessment, and feedback were faster.
   v.   Comprehensive and robust database for reports was generated.
   vi. The cost of report process was greatly reduced.
   vii. Staff efficiency and effectiveness of report process were highly improved.

4.0 Discussion and Conclusion
4.1 Discussion on Findings

i.   **Report scoring and computation were accurate:** This meant that the various scores and their computation reflected true state of what the reports actually attracted without error. This finding was in line with the view of Open [11]cited in this work that held that some in-house applications were developed to enhance the accuracy of the office's various business processes. A similar view was expressed by Wang [16]equally cited in this work, who opined that machines were capable of producing the same standard of product over and over again, which reduces human error.

ii.**Report submission, assessment, and feedback were faster**:

Under the new system, reports were submitted via e-mail which was faster than manual, the same way feedback was sent. This finding was in consonance with Wang [17] position which held that with the adoption of ICT, production should be increased as some activities would be speeded up. Similar view was held by Samii [13] pointed out in the review that said that the network-centred phase brought by ICT resulted in increase in the speed and volume of communication, making coordination of globally dispersed activities easier. Towing the same line, Open [11] asserted that E-

procurement practices and procedures resulted in reduction in time as would be seen under review of literature.

However, the finding was at variance with Ugwuegbulam [15] position that ICT effect on Speed has a number of negative effects namely: unemployment and dehumanization, laziness, and reduction of manual capacity, discussed under literature review.

Granted these negative aspects existed, but proper control measures could reduce them in terms of retraining of staff displaced by ICT in order to engage them in other aspects if not ICT, productive utilization of the time gained as a result of ICT introduction, and rechanneling of the manual capacity to other areas.

iii. The cost of report process was greatly reduced:

This implied that the huge amount spent on vehicular transport to and fro the State Headquarters from LG offices to submit and collect feedback on report drastically reduced, because of the e-mail mode adopted, which cost very little compared to vehicular transport mode.

The finding was in line with the view of Adesina [1] discussed under review, which held that ICT made it possible to package and transmit information across the world at a very low cost. This also corroborated the stand of Borghoff [4] expressed under review that stated that the networked-centred phase we were in induced a decrease in the cost of information, facilitating global activities for an increasing number of firms. Falling under this finding also was the view rof Wang et al [17] expressed in review that held that to save time and cut cost, decision makers should focus more on ICT utilization and business process redesign. Likewise, Borghoff[4] opined that transaction and coordination costs were reduced by ICT in all forms of organization.

However, this finding contradicted the view of Adewunmi et al [2] referred under review, which opined that the cost of using ICT may cause a no of problems for organizations. According to them, ICT was expensive to adopt and maintain.

Although ICT might be expensive at inception, but the gains from long usage would make ICT cheap when compared with other methods.

iv. **Staff efficiency and effectiveness of report process were highly improved**.

This implied that the staff would be more efficient in their operations, which would result in greater performance when compared to the old system. Then the report process would be more effective, resulting in more productivity.

In consonance with this finding was the position held by Open [11] referred to under review of literature, which identified the positive effects of ICT on Efficiency and Effectiveness as promotion and enhancement of overall operational efficiency and improvement in procurement efficiency,effectiveness, and transparency. Furthermore, in line with the finding was the view of Blaine & Roche [3] equally found in review that held that the efficiency of the external marketplace was affected by ICT.

A contrary view to this finding was held by Pillar [12] cited in review when he pointed the negative effects of the increasing amount of information to be processed (information overload) and organizational nterdependencies (boundary-spanning problems). Reinforcing the opposite view Borghoff[4] also referred to under review held that ICT could be a basis for the development of strategic success factors by enhancing product utility or organizational innovation and efficiency but does not constitute a competitive advantage per ser.

Yes there may be the problems of information overload and boundary-spanning, yet improvement of staff efficiency and effectiveness could not be taken away as a strong influence of ICT

4.2 Conclusion

The digital age and consequent automation of some operations made the application of e-assessment a success. This research work succeeded in developing an e-assessment system. The application of e-assessment made report assessment faster, cheaper, and more effective than manual assessment. The system also gave research managers and research attendants easier means of doing their job by offering quicker scoring and computation as well as comprehensive report database.

The research project indicated that there were a lot of factors that contributed to inefficiency and low productivity under manual assessment of report. These factors were taken care of by the package developed.

5.0 Recommendations

Based on the achievements of this study, we recommended the following:

i. The fact that operation of e-assessment requires computer skills, only Staff with requisite computer knowledge should man the Planning, Research, and Statistics (PRS) Department of organisations.

ii. Budgetary provision should be made for the take-off and maintenance of e-assessment system in organisations.

iii. There should be periodic modification of the e-assessment at least every 2 years to make it responsive to the changing challenges of organisations.

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