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THE IMPORTANCE OF INTERNAL AUDIT IN THE EFFECTIVE MANAGEMENT OF INFORMATION SYSTEMS: THE CASE OF ENAGEO

العنوان أهمية التدقيق الداخلي في الإدارة الفعالة لأنظمة المعلومات: حالة المؤسسة الوطنية للجيوفيزياء

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Abstract:

Information systems impact the business processes of the company for the purpose of improving its operational efficiency and the development of its activity, however these systems bear challenges in terms of performance, organization and risks. … This pushes leaders to use internal audit in order to master and improve the efficiency of information systems.

In order to understand the importance of internal audit in the effective management of information systems, we carried out an audit mission of the human resources information system E-GRH within the company ENAGEO, a subsidiary of the group SONATRACH. This case study confirmed the positive contribution of internal audit to the improvement and efficiency of information systems.

Keywords: Information system; Internal Audit; Human resources; Efficiency.

JEL Classification Codes: M12, M42.

ملخص:

تؤثر أنظمة المعلومات على العمليات التجارية للشركة بغرض تحسين كفاءتها التشغيلية وتطوير نشاطها ، إلا أن هذه الأنظمة تتحمل تحديات من حيث الأداء والتنظيم والمخاطر. ... هذا يدفع القادة إلى استخدام التدقيق الداخلي من أجل إتقان وتحسين كفاءة نظم المعلومات.

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من أجل فهم أهمية التدقيق الداخلي في الإدارة الفعالة لأنظمة المعلومات ، قمنا بتنفيذ مهمة تدقيق لنظام معلومات الموارد البشرية $E-GRH$ داخل المؤسسة الوطنية للجيوفيزياء ، وهي شركة تابعة لمجموعة سوناطراك. أكدت دراسة الحالة هذه المساهمة الإيجابية للتدقيق الداخلي في تحسين وكفاءة نظم المعلومات.

كلمات مفتاحية: نظام معلومات؛ التدقيق الداخلي ؛ الموارد البشرية ؛ كفاءة.

تصنيفات JEL : M12, M42.

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1. INTRODUCTION

As technology becomes more of an organization's business and operations than ever before, auditors face a daunting challenge of how best to assess, organization-wide, risks related to information systems and related controls as part of their general audit and advisory missions.

Information systems impact the business processes of the company for the purposes of improving its operational efficiency and developing its activity, however these systems carry challenges in terms of performance, organization and risks, ... Identifying these risks, putting in place plans to manage them, and reporting any potential weaknesses in the functioning of the information system is of utmost importance.

This is why auditors must take into account the information systems (IS) environment, the applications and productions that are part of the infrastructure, the management mode of applications and operations and the relationship between these applications / operations as well as, the organization of the latter, by identifying the components of the infrastructure of information systems, in order to obtain information concerning the vulnerabilities and threats linked to the infrastructure.

Indeed, internal audit may decide to draw the attention of general management to these risks generated by information systems, to assess whether the information systems are in line with the strategy, and should have clearly formulated objectives and approaches specifying how the processes will be affected,

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Through this article, we will assess the information system on human resources management (E-GRH) set up within the company ENAGEO, a subsidiary of the oil group SONATRACH.

2. AUDIT OF INFORMATION SYSTEMS

The information system is of great use within the company, since it serves as a decision-making aid, it also allows you to act in an optimal way, to make forecasts that will guide the strategies developed. In addition, it is used to control and supervise the various activities of the company.

With the complexity of the business environment, leaders rely on an efficient and reliable information system to create value and realize competitive advantage. The information system represents the set of means, resources and organized elements making it possible to collect, enter, process, store and disseminate information (Toury, 2006).

Information systems auditing has grown significantly in recent years, following the major financial scandals and the emergence of the new form of fraud through the use of cyber-attacks.

The IT audit or audit of information systems consists of an intervention carried out by an independent person external to the audited service, which makes it possible to analyze all or part of an IT organization, establish an observation of strengths and weaknesses and thus identify recommendations for improvement. In other words, IT audit can also be defined as the risk assessment of IT activities, with the aim of reducing them and improving the control of information systems (Yende, 2018).

The purpose of the IT audit is to identify and assess and determine the risks (operational, financial, reputational, etc.) associated with the IT activities of a company or an administration.

To this end, for its effective implementation, an information systems audit process will be based on three essential aspects (Yende, 2018):

- The regulatory framework of the sector of activity of a given country;
- The existing good practice repositories (example the CobiT, ITIL, VAL IT…);
- The benchmarks available and on the professional experience of the auditor involved.

Likewise, the audit of information systems requires two main characteristics for its effective implementation:

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- The first characteristic comprises the global evaluations of entities during which all activities relating to information systems are evaluated.

- The second characteristic corresponds to the assessments corresponding to thematic audits, aimed at reviewing an IT theme within an entity (project management, logical security for example).

3. COBIT

The audit of information systems constitutes a means of piloting an information system, several repositories are used by the audit, COBIT is among these repositories which provide parameters for the evaluation of the state of information systems., it is a tool which makes it possible to set up an internal control and reference system which will guide the governance of the IS through best practices.

The COBIT repository is the benchmark model for auditing and controlling risks related to information systems (Delmande & Gautier, 2007).

Cobit (Control Objectives for Information and related Technology) is "An IT governance model describing IT processes whose objective is to make the link between business requirements, control needs and any technical constraints. It is a control framework that aims to help management manage risks (safety, reliability, compliance) and investments. It is used in particular in the context of audits "(Bohnké, 2010)

COBIT helps ensure that:

- Information systems are aligned with the business lines of the company;
- IS bring a plus to the trades and maximize its results;
- IS resources are used responsibly;
- IT risks are managed properly.

3.1. The controls defined by the COBIT standard

COBIT's IT processes encompass general IT controls and application controls (ISACA, 2019):

General controls are those that are built into IT processes and services. They concern, for example:

- Systems development;
- Change management;
- Security ;
- Operation.

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Application controls are controls integrated into business process applications. They concern, for example:

- Completeness;
- Accuracy ;
- Validity ;
- Authorization;
- Segregation of duties.

3.2. The information criteria set by COBIT

COBIT defines objectives for the management of the information that must be contained and provided by a successful information system. For this, 7 objectives are defined in terms of information and data management by COBIT (ISACA, 2019) in which the information must demonstrate:

- Effectiveness: relevant and useful for business needs, effective information is complete and delivered at the right time in the formats suitable for its use;
- Efficiency: the cost of obtaining and making it available is minimal and in any case, it corresponds to an optimal use of resources;
- Confidentiality: all confidential information is protected and is only disclosed to authorized persons;
- Integrity: the information is exhaustive and accurate. It is valid and corresponds to the expectations of the company;
- Availability: the necessary resources and the means associated with safeguarding information are appropriate;
- Compliance: the business process is subject to laws, regulations, contractual clauses and professional ethics to which it must comply;
- Reliability: the information provided must allow management to steer the company and exercise its fiduciary and governance responsibilities.

All of these objectives should serve to promote recognition of IT and information systems as sources of value creation in the service of company strategy.

4. RESEARCH METHODOLOGY AND TOOLS

The general objective of this audit of the E-GRH information system, which took place from 01/03/2020 to 31/05/2020, was to assess the degree of mastery of the information systems "Management of human resources E-GRH " in order to improve the quality of this information system.

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As part of this empirical study, audit techniques (quantitative and qualitative) were chosen to answer the problem of our research.

Regarding the qualitative tools and techniques, we first resorted to a pre-survey of managers (the IS director, users of the E-GRH application) to understand the functioning of the system, the problems encountered in matters of governance of the information system as well as risk prevention measures.

Regarding quantitative tools, we opted for an internal control questionnaire carried out with users of the E-GRH application to detect any dysfunctions related to internal control.

Then, we used a documentary analysis and carried out various tests to evaluate the dysfunctions of the system according to two aspects, namely:

- Security of the e-GRH information system
- Operation of the e-GRH information system by activity

This study was carried out on the basis of the COBIT information systems audit and management framework (ISACA, 2019).

This audit mission was, of course, attached to the evaluation of the objectives of internal control; namely:

- Security of assets;
- The reliability of information;
- Compliance with regulations and procedures;
- The efficiency and effectiveness of operations.

And targeted the following components:

❖ **Security of the e-GRH information system**

- Ensure that the access rights to the various functionalities are assigned according to the rules of segregation of duties and are logged;

- Ensure that the records (entries) made in each module are justified by a valid supporting document, and that the latter is accessible at all times (referenced recording);

- Ensure that the application controls on the input, processing and output data and ensure that this data is authorized, exhaustive, accurate, up-to-date and disseminated to whom it may concern;

- Assess the degree of use of the IT application by the various user structures, in particular HRAM and GAD structures;

- Ensure that data is entered without delay and assess any constraints encountered;

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- Ensure the existence of an updated user manual (or operating procedure);

- Ensure that the application meets user needs and reduces processing times.

❖ **Operation of the e-GRH information system by activity**

✓ **Recruitment and career management activity**

- Appreciate the computerized management of the recruitment process:

• Recruitment requests;

• Jobs ;

• Applications;

• Tests and results.

- Ensure that vacant positions, particularly in management and responsibility, are identifiable in the application and that the deadline for filling them is defined (deadline);

- Ensure that the criteria that contribute to the monitoring of career management are entered in the application (training, history of positions held, transfers, steps, promotions, annual evaluation, sanctions, ...);

- Ensure that the "recruitment" and "career management" modules make it possible to disseminate updated data on:

• Recruitment requests expressed by the structures;

• Job offers submitted by the Company to NEA counters;

• Recruitments (completed and in progress), by profession, structure and cities;

• The workforce by PSC, by structure, by work system, by sector (production, administrative support, technical support), ...

✓ **Administrative management activity**

- Ensure that the computerized processing of leaves (AL, RL, ..), balances, deductions, ..., is designed and configured in accordance with regulations (labor code, collective agreement);

- Ensure that the application makes it possible to consult the individual situation of staff in real time (presence, right of leave, end of contract, transfer, promotion, etc.);

- Ensure that the accumulation of leave balances, end of contract, .., are systematically alerted and notified;

- Ensure that the staff situation is updated in the application in accordance with the authentic administrative file (paper medium);

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- Ensure that the application makes it possible to edit the management documents used in HRM activities on the basis of integrated data:

• Leave title (RL, AL, EL);

• Contract;

• Mission order ;

• Statement of mission expenses, travel expenses,…;

• Work certificate, ...

- Ensure that the personnel costs provided by the application are consistent with the accounting data;

- Ensure that the application makes it possible to provide valued and dynamic indicators on:

• Absenteeism by structure, nature (sick leave, unpaid leave, work accident, etc.), frequency and impact (cost of absenteeism);

• The holidays ;

• Staff costs (by structure, etc.) and their variation;

• The flow of personnel (entries / exits),… etc.

- Appreciate the level of integration of the e-GRH and G-payroll applications.

✓ **Training management activity**

- Evaluate the main functionalities of the training module:

• Identification and consultation of training needs;

• Monitoring of the annual training plan;

• Training program (planning);

• Monitoring of training sessions and participants, ...

- Ensure that the system makes it possible to provide up-to-date situations on:

• The realization of the annual training plan (achievements, advancement, accumulation,…);

• Training provided by socio-professional category (participants), by structure, by field (technical, administrative, etc.).

✓ **Social service management activity**

- Appreciate the computerized monitoring of social service activities:

• Follow-up of files received, processed and paid (work stoppage, work accident, retirement, ...);

• Monitoring of declarations (monthly and annual);

- Ensure that the system makes it possible to provide up-to-date

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situations on work stoppages by nature, social charges, ...

✓ **Activity management of social and cultural works**

- Appreciate the computerized management of the activities of social and cultural works;

- Ensure that the situation of social loans on e-GRH is consistent with the situation on G-pay (assess the maturity of the level of integration);

- Ensure that the application makes it possible to give valued and updated situations on current social loans, repayments, etc.

✓ **MSC medical center management activity**

- Ensure that the hiring, annual and periodic medical visits are followed in the application;

- Ensure that the exposed positions are defined in the application;

- Ensure that the system makes it possible to provide up-to-date situations on:

• Medical examinations carried out by type, by structure,…;

• The schedule of medical visits.

5. RESULTS AND DISCUSSION

In what follows we will try to identify the main weaknesses according to the two aspects detailed below:

5.1. Security of the e-GRH information system

5.1.1. Persistence of anomalies relating to leave and insufficient treatment

Anomalies identified by users when handling the e-GRH application are not reported and addressed in a methodical manner in order to permanently remedy them.

Indeed, anomalies are reported by E-MAIL and sometimes verbally to the information systems department without a formal description of the anomaly by the users (description sheet) and without opening a pre-established monitoring sheet to inform by both parties. The current situation does not allow us to keep a trace of the source of the malfunction in the event of the possible recurrence of the problem.

In addition, anomalies persist in the leave section. Below are some anomalies identified (as of the audit date) when entering the payroll variable in the information system:

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- Case n ° 1: Value of the annual leave allowance of (7) days not calculated by the system, despite the prior entry by the movement department.

- Case n ° 2: Wrongly generation of nine (9) days of leave (AL), already cleared at (m-1) during the calculation of the STC, this error was identified after the date of renewal of the contract of job.

- Case n° 3: Thirteen (13) days of leave (AL) not taken into consideration, despite the prior entry by the movement department.

- Case n ° 4: Inconsistency between the date of departure on leave and the date of resumption (fictitious movement), thus generating a negative number of days.

This insufficiency can generate several risks related to the write-off or wrongly payment to employees in the event of unidentified errors, as well as the risk of a prolonged crash of the application in the event of the unexpected departure of the IT specialists who participated in the development of the application because of the increased dependence of users on IT management.

5.1.2. Weakness in access management and lack of separation of entry and validation tasks

Several violations of internal control rules have been identified, namely:

- Accumulation of entry and validation rights by different profiles: case identified at the level of the human resources department (HRD), where managers, the head of service and the head of department combine the same privileges in the application;

- Handling of operations by IT specialists in a production environment (at the request of users). In fact, 263 operations were recorded by the IT specialist between 2016 and 2019, as illustrated below.

Table 1. Number of operations recorded by IT specialists

Year	Number of operations
2016	67
2017	73
2018	29
2019	94
Total	**263**

Source: E-GRH application

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This transgression of internal control rules generates several risks such as:

- Disparity between the management mode practiced and the application;
- Risk of errors following the entry and validation of transactions by the same user;
- Risk of ill-intentioned manipulation.

5.2. Operation of the e-GRH information system by activity

5.2.1. Delay in entering data into the application

Data relating to employment contracts and staff movements are entered late in relation to their effective date.

- Delay in entering employment contracts in the application

Below is an illustration of the employment contracts entered late in relation to their effective date:

Table 2. Labor contracts entered late

Structure	% Contract entered		
	Less than (7) days	From (7) to (30) days	More than 30 days
SED	36%	53%	11%
HSTD	95%	2%	2%
EM	91%	6%	3%
LD	93%	7%	0%
CSM	47%	50%	3%

Source : E-GRH application

In the 2019 financial year, "employment contracts" entered after the week following their effective date amounted to (64%) at the level of the "SED", and (53%) at the level of the "CSM".

- Delay in entering movements in the application

Below is an illustration of the movements (AL and RL) entered late in relation to the effective date of these movements:

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Table 3. AL and RL movements entered late

Structure	% seized movements		
	Less than (7) days	From (7) to (30) days	More than 30 days
SED	87%	12%	2%
HSTD	91%	7%	1%
EM	97%	2%	0%
LD	98%	2%	1%
CSM	80%	19%	1%

Source : E-GRH application

In the 2019 financial year, movements entered after the week following the effective date of the movement amounted to (14%) at the level of the "SED", and (20%) at the level of the "CSM".

The late entry has an impact on the availability of information in a timely manner; and incomplete information generation by the system and impact on payroll calculation time; Cumulative input delays and impact on personnel management as well as the impact in the development of dashboards generated by the application.

5.2.2. Insufficient use of the application for the generation of management documents

Some management documents are produced manually (MS office), although the developers have planned their automatic preparation in the application, in the case of:

• The monthly attendance report

Prepared in an Excel file from data previously entered into the application by the movement service.

• Statements of mission expenses

Prepared in a Word file on the basis of the mission order approved by the hierarchical manager of the missionary.

• Summary sheets

Prepared in a Word file on the basis of the authentic personnel file.

In addition, the "employment-training" contract is still not edited by the application, the managers use a template in Word.

Failure to use the application for the generation of management documents generates several risks such as the risk of error during entry and

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the disparity in the calculation method (mission costs) between the different structures.

5.2.3. Insufficient identification of vacant positions

Information relating to vacant positions cannot be collected from the e-GRH application.

This insufficiency has an impact on decision-making at the central level (HRAD and EM) regarding vacant posts.

5.2.4. Insufficient management of jobs and skills by the information system

- Recruitment

Installed in the application according to the regulations in force, the recruitment module has not been used by users since 2017.

Company recruitments are tracked in an Excel file at the level of the HR Management department of the HRAD, the GADs of the structures must contact the latter to inquire about their recruitment requests, note that the process sometimes reaches a delay of 6 months.

- Training

The training component in the application is limited to the development of the annual plan and the on-the-spot assessment, the other modules have not yet been used, the status of the modules constituting the training component is given below:

Table 4. Status of the modules

Module	Progress
Expression of need	Not started
Annual plan & implementation of the annual plan	Finalized
Hot assessment	Finalized
Effectiveness evaluation	Suspended
Exit states	Finalized
Archive recovery	Suspended
Apprenticeship training	Not started
Management of loyalty contracts	Not started

Source : E-GRH application

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- Jobs and career management

The current e-GRH information system does not include job and skills management, in fact:

• Job requirements are not integrated into the system;

• The career tracking module in the system is not yet used by users.

5.2.5. Delay in validating the MPI and NSIF social benefits management module and not taking into account social works activities (except social loans) and MSC in the application

- Social management activity

The use of the application by the social service is limited to the establishment of WSC, as for social benefits MPI and NSIF, they are monitored in an Excel file.

- Activity management of social and cultural works

The social and cultural works module is limited to the management of social loans granted (paid), the other tasks and activities are followed manually:

• Follow-up of requests for loans and social assistance;

• Selection criteria for (priority) beneficiaries;

• Monitoring of the implementation of the CSO program, etc.

- Medical center management activity (MSC)

The current e-GRH information system does not include management of MSC activities.

These weaknesses generate several monitoring difficulties.

6. CONCLUSION

Through the study developed, we may have observed inadequacies in the security of the information system as well as in the level of operation of this information system by activity, namely: Recruitment activity and career management, Administrative management activity, Training management activity, Social service management activity, Social and cultural activities management activity, Medical center management activity.

These shortcomings detected by the audit show that internal audit plays a very important role in the effective management of information systems.

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Indeed, the company must ensure better access management and manage the privilege for each user while respecting the rules of internal control.

To ensure the proper functioning of the information system, the company must:

- Implement the necessary means to ensure instant data capture (material and organizational means);
- Further encourage users to enter transactions in real time.
- Realize the use of the recruitment and career management module
- Speed up the validation and implementation of the MPI and NSIF social benefits management module.

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