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**Ideas of Youth employees regarding Auditing and technology**

Abstract

The State audit bureau (SAB) of Kuwait provides a high priority to enhance auditing work and improve the experience of auditors. Also, it has a high understanding on the role that youth employees have on the organization’s future. There should be a mutual bound between their perspectives in improving their skills and the goals that decision makers consider regarding auditor level and working environment.

This paper is dedicated to measure the positive relation between a set of ideas provided by some youth employees and the training factors that are adopted in SAB. The ideas revolve on improving auditing and enhance experience, whereas the selected factors affect the goals that SAB seeks within improving auditor’s different capabilities.

The study depends on a survey used to measure the importance weights of these factors based on set of decision makers in SAB. These weights are used to compute the support percentage of each idea and the selected set of factors. Also, the study measured the positive trend line of youth’s ideas and the provided weights.

Several successful results are found regarding the weights of the training factors and the positive relation that shared with youth’s ideas, which leads to the conclusion that youth generation has a good level of maturity in thinking that can produce a positive change in SAB.

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# **1.Introduction**

Auditors are one of the most critical resources that affect the success of any organization. They need more considerations with building their experience to maximize their ability to accomplish their tasks. Each auditor is as an important investment that built through learning and training. Their experience should include the ability to make a change that improve their work.

Youth auditors hold a significant role in creating SAB future due their responsibilities that aggravate through their several years of experience. Some auditors manage teams or supervise higher positions in SAB. Thus, it is important to know their ability in creating a positive difference in their organization. The paper focuses on the positive correlation between youth ideas and SAB’s direction regarding maximizing auditors’ experience and abilities.

## **1.1.Hypotheses**

The main hypotheses is having a positive relation between youth’s ideas and the adopted training and learning factors in SAB. This positive relation is identified by the percentage of support that ideas provide to the training factors which assumed is at least 30%.

## **1.1.Methodology**

The paper studies the relation between the youth’s ideas and the supported training factors that chosen by SAB. To prove paper’s hypothesis, following procedures are applied:

1. Study the training and learning factors that are adopted outside SAB
2. Study the training and learning factors that are adopted inside SAB
3. Rank selected factors based on its importance using a set of decision makers in SAB.
4. Compute the importance weight that each factor has with respect to the taken opinion from the decision makers.
5. Compute the support percentage of each idea have with the selected factors using their importance weights.
6. Find the average of all support percentages of all ideas.

The positive relation becomes stronger whenever the support percentage has a higher value. The following diagram shows the methodology of the paper:



# **2.Learning and training factors**

Several factors affect learning process. The research team studied the organization’s adopted approach to accomplish the learning process and its expected goals to construct the list of factors that have an effect on the goals. The following subsections are dedicated to detail the learning factors inside and outside SAB.

## **2.1.SAB External Learning Factors**

The ministry of education is a governmental entity that is responsible of teaching has a national center for the development of education and teacher standards. The center collaborated with technical assistance from World Bank to conclude the factors that affecting learning process and experience level [4]. The found factors are generic ones that suits all learning environments. However, due to the paper’s scope the goals and factors are presented considering SAB environment.

The main goals of the provided standards are divided into three main categories: professional knowledge, practice and responsibilities. The following diagram illustrates the list of goals within each category.

**Professional Knowledge**

Table(A) summarizes the factors that affect the previous goals. Each factor has an expected status to reach the goals. (🡩) indicates that the expected status is increasing. Whereas, (🡫) indicates that the expected status is decreasing.

|  |  |
| --- | --- |
| Factor | Expected Status |
| Auditor knowledge | 🡩 |
| Identification level of relevant information | 🡩 |
| Experience through practice  | 🡩 |
| Auditor performance | 🡩 |
| Professional development  | 🡩 |
| Audit improvement | 🡩 |

Table(A)

## **2.2.SAB Internal Learning Factors**

SAB accomplished an Adopted manual that contains all learning rules for auditors [1][2]. It specifies the required durations that an auditor should spent into training and learning. These durations can have different forms such as courses, conferences, online, … ect. The manual was focusing on the consumed time on learning and the needed fields to focus on. However, there is no specification of the subjects due of expecting several improvements and development within the preferred fields that new subjects might be included. The manual presents the goals that should accomplished as follows:

1. Increasing the quality of the job.
2. Fulfilling the responsibility to maintain the appropriate knowledge and skills for ongoing developments in the accounting and auditing profession.
3. Raising the auditor’s information and knowledge regarding accounting, auditing, taxation and information technology.
4. Raising the skills of the professional behavioral, management methods and communication with others.
5. Keeping up with the responsibilities and duties contained in the auditor’s job description.
6. Supporting the diversity of topics and the scope of information relevant to the professional work of the employee.
7. Raising auditor’s performance level.
8. Improving the processes and procedures that are associated with auditing.
9. Increasing the quality of outputs.
10. Optimal utilization of working hours.
11. Reducing the frequency of repeated errors during auditing and review.

Table(B) summarizes the factors that affect the previous goals. Each factor has an expected status that SAB consider to reach its goals. (🡩) indicates that the expected status is increasing. Whereas, (🡫) indicates that the expected status is decreasing. Also, each factor is identified with a unique ID that is used in Study section.

|  |  |  |
| --- | --- | --- |
| ID | Factor | Expected Status |
| $$F\_{1}$$ | Quality of the job | 🡩 |
| $$F\_{2}$$ | Up-to-date knowledge | 🡩 |
| $$F\_{3}$$ | Knowledge level specialized in main work of auditor  | 🡩 |
| $$F\_{4}$$ | Knowledge level specialized in professional personality and communication  | 🡩 |
| $$F\_{5}$$ | auditor’s job description | 🡩 |
| $$F\_{6}$$ | diversity of Professional development topics | 🡩 |
| $$F\_{7}$$ | Performance level | 🡩 |
| $$F\_{8}$$ | Development of auditing processes and procedures | 🡩 |
| $$F\_{9}$$ | Quality of output | 🡩 |
| $$F\_{10}$$ | Utilization of working hours | 🡩 |
| $$F\_{11}$$ | frequency of repeated errors | 🡫 |
| $$F\_{12}$$ | Identification of relevant information  | 🡩 |

Table(B)

The created external list of factors is suitable for any learning environment. Thus, it was general. Whereas, internal factors are specified to auditing environment. Thereof, it is more detailed and more suited to the actual responsibilities of auditors in SAB. After observing the logical impact of the listed factors, some factors are cause factors. These factors have a high indirect impact on other factors. Thus, the organization should consider them with a higher priority:

1. Quality of the job.
2. Up-to-date knowledge.
3. Knowledge level specialized in main work of auditor
4. Performance level.

## **2.3.Importance Weight of Training and Learning Factors**

As detailed in the previous section, raising auditor’s abilities is affected by several factors. These factors should be considered within each training form that auditor has or any idea that is provided to enhance auditor’s work. Moreover, each factor should have a weight that reflects its importance. The expected values of such weights lay on the interval [0,1]. Also, the total values of all weights should reach 1. Mainly, there are several ways to measure such weights [6]. In the said paper, the weights are computed based on the opinion of decision makers in SAB. Each expert considers his experience to provide a ranking before computing an overall weight for each factor.

# **3.Youth’s Ideas of Auditing and Technology**

In 2017, SAB conducted a forum that included many activities. One of these activities was to present a set of ideas that improve the work in SAB [3]. There was one main constraint for idea’s owner which was having an age that is less than or equals 35. The goals of the event were:

1. Study the applicability of applying new ideas from youth employees that improve the work in SAB.
2. To measure the maturity of thinking that youth employees have during their limited number of experience in SAB and their ability of making a positive change in their working environment.

After filtering the results, the selected ideas categorized into three main categories: Collaboration, Training without technology support and Training with technology support. Each following section details the ideas within each category. Table(C) contains a list of ideas such that each idea has a unique ID that is used in study section.

|  |  |
| --- | --- |
| ID | Idea Name |
| $$Id\_{1}$$ | Professional and academic cooperation |
| $$Id\_{2}$$ | Comprehensive auditor |
| $$Id\_{3}$$ | Conference Effective Response to Change |
| $$Id\_{4}$$ | Audit support |
| $$Id\_{5}$$ | Auditor’s Protocol |
| $$Id\_{6}$$ | Training Track |
| $$Id\_{7}$$ | Auditor License |
| $$Id\_{8}$$ | Unlimited Auditors |
| $$Id\_{9}$$ | Biggest Auditor |
| $$Id\_{10}$$ | SAB Application |

Table(C)

## **3.1.Ideas Related to Collaborations**

1. **Professional and Academic Cooperation**

Maximize the society’s knowledge about the significant role of SAB by collaborating with the educational institute to improve a suitable material for students with different levels.

1. **Comprehensive Auditor**

Opens the door to mandate between pre-audit sector and post audit sector for a predefined duration. This process will enhance the knowledge transfer between auditors. In addition, the mandated employees will have a greated chance to present SAB in external missions.

1. **Effective Response to Change Conference**

A yearly conference held by a selected team of employees in SAB. It has a defined structure and list of activities as follows:

1. The conference revolves on a pre-selected subject that might change every year.
2. It is hosted by prominent figures and members of legislative committee in national assembly to study and improve the collaboration mechanism between SAB and parliament regarding the implementation and improvement of governance.
3. It has workshops, lectures and discussion groups regarding the selected subject.
4. Preview the main three achievements of SAB during the previous year.
5. Honoring all SAB employees that got promotion within the year and encouraging them for their efforts.
6. **Audit support**

It supports the concept of having a call center for consultations. Thus, any auditor can communicate with the call center to be redirected to the most suitable expert. The set of the selected experts should have predefined criteria such as their specialty or the entities that worked in before. Thus, the expert with most suitable criteria to the current request will provide the required consultation.

## **3.2.Ideas related to Training without Technology Support**

1. **Auditor’s Protocol**

It facilitates the enhancement of the auditor’s knowledge regarding all procedures, traditions and rules of tact that prevail in international transactions and communications. Auditor’s protocol supports having several workshops and updatable materials done by professionals. These workshops are mandatory for those with near official external missions.

1. **Training Track**

It adds one constraint to employee’s promotion, which is completing a set of subjects, and training courses based on his specialty and experience level. It supports the concept of defining a training path for each specialty that starts on the employment date and end on the retirement date with predefined milestones, which is the expected promotion date. The employee should cover all the listed training courses and subjects before reaching the next milestone.

1. **Auditor License**

It is an official certificate for auditors in SAB that renewed every four years. Auditor must apply and pass an exam that created by a selected team of highly experienced auditors in SAB. Exam’s registration is in semi-annually matter with a prior existing material that divided into the following categories:

* Lows, rules and approved auditing guidelines that used by SAB.
* Specialized auditing guidelines that used per sector.
1. **Unlimited Auditors**

It is a training program conducted to the newly accepted auditors. The program’s duration reaches to five months with several levels and subjects that vary in difficulty. Each level focuses on some tasks, subjects and responsibilities that SAB’s auditor perform. On the advanced levels, the auditor needs to have a practical training on some official auditing offices or actual entities that are subject to SAB’s control.

## **3.3.Ideas Related to Training with Technology Support**

1. **Biggest Auditor**

It is an artificial intelligent (AI) engine that is built based on:

* Set of documents from entities are subject to SAB’s control.
* collected violations by SAB.
* Auditing guidelines of each sector.

The AI engine used as following:

* Training application with many levels. On one hand, auditor should discover a violation using the provided set of documents and auditing guidelines. On other hand, he can use a pre-given virtual balance to start an auction with other auditors. Thus, the lowest bidder will provide a paid consultation for the current one. The program can provide other type of paid support such as eliminating unrelated documents or showing relations between some related ones.
* Electronic consultant to guide the auditors as follows:
	+ Identifying the existence of violation.
	+ Identifying a similar cases documents.
	+ Leading to the parts of the guidelines that should auditor consider while observing the current document.
1. **SAB Application**

It is a smart device application that combines the concept of social media and auditor’s consultation. Most social media applications depend on pictures and videos as a main source of data. In the current application, it depends on auditor’s published reports. Thus, other auditors, which follow the current user, can provide a consultation through posting a comment or like. On the other hand, it has other facilities of social media like filtering, capturing and uploading services on auditor reports instead of images or videos.

# **4.Study**

In this paper, there are two main measurements to prove the hypothesis. The first measurement is related to find the importance weight of the selected training factors. This is done through a distributed survey for decision makers in SAB. The second measurement is related to compute the support percentage that Youth’s ideas have to the training factors considering the found weights.

## **4.1.Importance Weight for Training factors in SAB**

### **4.1.1.Survey**

The importance weight of each factor ($F\_{i}$) is computed based on a survey that is provided to decision makers in SAB. The total sample of the survey was 24 employees. The survey was developed using ASP.NET technology and MSSQL database. It was published online and distributed through official SAB mails. In addition, there were several visits to the higher management to complete the survey and request their opinion on having extra learning factors that affect auditor’s experience. The included questions are divided into three main parts:

* 1. Respondent’s main information such as being a supervisor or not and number of experience years.
	2. Table of factors to rank based on respondent’s perspective.
	3. Ability of receiving extra factors that a respondent considers important in the learning and training process.

### **4.1.2.Analysis**

Based on the respondents’ answers, each factor $F\_{i}$ has list of different ranks provided by different respondents $\left\{f\_{1},f\_{2},…,f\_{j},…,f\_{r}\right\}$ where the value $(r)$ is the total number of respondents. The overall rank $R\_{i}$ for each factor $F\_{i}$ is the floor value of the average of all provided ranks in $\left\{f\_{1},f\_{2},…,f\_{j},…,f\_{r}\right\}$:

$$\left⌊R\_{i}= \frac{\sum\_{j=1}^{r}f\_{j}}{r} \right⌋$$

Computing the weight of each factor $W\_{i}$ has two steps [5]:

1. Normalize the overall ranks $R\_{i}$ to value $N\_{i}$ that is included within range [0,1]:

$$N\_{i}=\frac{\left(N+1\right)-R\_{i}}{N}$$

Where N is the number of the selected factors. The following graph shows the previous equation:

1. The weight of each factor $W\_{i} $ is the result of dividing each normalized value $N\_{i}$ over the sum of all normalized values. Thus, the sum of all weights will be 1.

$$W\_{i}= \frac{N\_{i}}{\sum\_{i=1}^{m}N\_{i}}$$

Table(D) presents the weights for all selected factors in the current study ranked from the highest weight to the lowest weight:

|  |  |  |  |
| --- | --- | --- | --- |
| Rank | ID | Factor | Overall Weight × 100 |
| 1 | $$F\_{1}$$ | Quality of the job | 14.08163% |
| 2 | $$F\_{2}$$ | Up-to-date knowledge | 12.78912% |
| 3 | $$F\_{3}$$ | Knowledge level specialized in main work of auditor  | 11.56463% |
| 4 | $$F\_{4}$$ | Knowledge level specialized in professional personality and communication  | 9.251701% |
| 5 | $$F\_{7}$$ | Performance level | 8.095238% |
| 6 | $$F\_{5}$$ | Auditor’s job description | 7.755102% |
| 7 | $$F\_{8}$$ | Development of auditing processes and procedures | 7.55102% |
| 8 | $$F\_{9}$$ | Quality of output | 6.938776% |
| 9 | $$F\_{6}$$ | Diversity of Professional development topics | 5.986395% |
| 10 | $$F\_{12}$$ | Identification of relevant information  | 5.442177% |
| 11 | $$F\_{10}$$ | Utilization of working hours | 5.306122% |
| 12 | $$F\_{11}$$ | Frequency of repeated errors | 5.238095% |

Table(D)

The following graph presents the importance weight of each training factors based on the decision makers in SAB. It shows that the most important factor is Quality of the job that is applied by auditor, whereas least important factor is minimizing the frequency of repeated errors.

### **4.1.3.Results**

1. The provided ranks specify that the most important factor is preforming the job in a high quality.
2. Top three factors show the main considerations of abilities within each auditor. These abilities revolve on applying the responsibilities using the latest core knowledge and in a high level of quality.
3. One of the highest ranks is the personality and the communication’s skills, which is important to auditor on several levels such as knowledge transfer, leading teams and sections.
4. Top five factors show that decision makers have a high understanding of the role that each factor perform. Because they provide a higher priority to the cause factors in a way to improve other factors indirectly.
5. Bottom three factors had a close weight due of auditor’s working environment. SAB designed an efficient environment through working in teams that increase the level of collaboration, review and direct consultation. Thus, it increases the ability of identifying relevant information, utilizing working hours and avoiding repeated errors.
6. The acting president of SAB introduced an important factor that improve auditor’s work, which is increase the Professional leading skills for the auditor prior each supervising position.
7. Some decision makers introduced more goals that improve auditor’s work. These goals should be studied before extracting the factors that affect them. The goals are as follows:
	1. Provide more lows and adjustments to encourage team works and the ability of measuring the level of collaboration between its members.
	2. Increase the integration between different sectors of auditing to enhance and fasten the process of auditing. The integration should take different levels such as human resources, documents and output.

## **4.2.Support of Youth’s Ideas and Training factors in SAB**

### **4.2.1.Analysis**

Based on the paper’s hypothesis, there should be a positive relation between the Youth’s ideas and learning factors in SAB. To measure such relation:

1. Use the unique Ids for each factor in table(B) and each idea in table(C) to create a coverage matrix in Table(E) to present the supported factors within each idea. Each row contains a set of the supported factors by an idea$(Id\_{i})$. Whereas, columns present the set of ideas that support a factor$(F\_{j})$. The support value $(SV\_{ij})$ is a binary value that summarized as following:

$$SV\_{ij}= \left\{\begin{matrix}1&Id\_{i} supports F\_{j}\\0& Id\_{i} does not supports F\_{j}\end{matrix}\right.$$

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ID | $$F\_{1}$$ | $$F\_{2}$$ | $$F\_{3}$$ | $$F\_{4}$$ | $$F\_{5}$$ | $$F\_{6}$$ | $$F\_{7}$$ | $$F\_{8}$$ | $$F\_{9}$$ | $$F\_{10}$$ | $$F\_{11}$$ | $$F\_{12}$$ |
| $$Id\_{1}$$ | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| $$Id\_{2}$$ | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $$Id\_{3}$$ | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| $$Id\_{4}$$ | 1 | 1 | 1 | **0** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $$Id\_{5}$$ | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| $$Id\_{6}$$ | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| $$Id\_{7}$$ | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |
| $$Id\_{8}$$ | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| $$Id\_{9}$$ | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| $$Id\_{10}$$ | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |

Table(E)

The support percentage $SP\_{i}$ of each Youth’s Idea $Id\_{i}$ and the selected training factors $\left\{F\_{1},F\_{2},…,F\_{N}\right\}$ is measured using the weighted mean [4] with the computed support values $(SV\_{ij})$ in Table(E) and the factors’ weight $(W\_{i})$ in Table(D):

$$SP\_{i}= \sum\_{i=1}^{m}W\_{j}×SV\_{ij}$$

Table (F) presents the support percentage of each idea with the selected list of learning and training factors:

|  |  |  |
| --- | --- | --- |
| ID | Idea Name | Support Percentage × 100 |
| $$Id\_{1}$$ | Professional and academic cooperation | 28.027% |
| $$Id\_{2}$$ | Comprehensive auditor | 87.211% |
| $$Id\_{3}$$ | Conference Effective Response to Change | 75.918% |
| $$Id\_{4}$$ | Audit support | 90.748% |
| $$Id\_{5}$$ | Auditor’s Protocol | 29.184% |
| $$Id\_{6}$$ | Training Track | 100% |
| $$Id\_{7}$$ | Auditor License | 73.265% |
| $$Id\_{8}$$ | Unlimited Auditors | 79.524% |
| $$Id\_{9}$$ | Biggest Auditor | 82.653% |
| $$Id\_{10}$$ | SAB Application | 79.456% |
| Average | **72.6%** |

Table(F)

The following graph presents the support’s percentage that each idea has to the selected training and learning factors. Training Track had a complete support 100%. However, Professional and academic cooperation had the least support percentage 28.027%.

The following graph shows the support of each factor among the selected set of Youth’s Ideas. 90% of ideas supported the ability to complete the assigned responsibilities in the job description. On the other hand, 50% supported the utilization of working hours.

The following graph presents the importance weight of each factor and the overall support that each factor has from the selected ideas. The importance weights were sorted from lowest to highest, which is similar to the trend line that youth’s ideas have regarding the support level of the learning and training factors. The direction of the trend line is light due of having a high level of balancing between the supported ideas over the selected factors.

### **4.2.2.Results**

1. The percentage of the support that is provided by Youth’s Ideas to the learning and training factors is up to 72.6%.
2. Youth’s employees have the intellectual maturity to make a positive change that matches the considered trend of decision makers in SAB.
3. Youth’s employees have the ability of improving the working environment within all training and learning factors in SAB.
4. Ideas with 100% support of the training factors are those, which already applied in SAB with some changes. For example, Training Track is applied in SAB for auditors only with no specification regarding the topics that should be taken. Whereas, the idea’s owner wants to generalize the concept to all type of employees with more accurate topics.
5. Some ideas have a very low support percentage to the learning factors. However, it has an important impact on SAB. This type of ideas has a low percentage due to the following reasons:
	1. Auditor’s protocol has a detailed purpose that revolve around a limited set of factors. Thus, the overall support is low.
	2. Professional and academic cooperation revolves around increasing outsider’s knowledge about SAB role and responsibilities whereas the training factors focuses on improving the auditor’s knowledge that works inside SAB. Thus, the scope of the idea is out of the factors that are used in SAB but has an important affect on the organization.

# **5.Conclusion**

In conclusion, there is a positive relation between Youth’s Ideas and SAB’s training factors. This relation approved after computing the support percentage, which is reached up to 72.6%. The results considered the importance weight of each training factor. These weights computed using a real ranking data built from a set of decision makers in SAB. On one hand, the support percentage, indicates that youth auditors can create a positive change in SAB environment. On the other hand, the relation shows a good level of mutual thinking between youth employees and decision makers in SAB. These indicators show that SAB provide a high consideration on building a qualified auditor that can lead several important roles in the future of SAB and create a positive accumulative change.

# **6.Recommendations**

There are several useful recommendations that should be considered:

1. Perform more events that permit youth’s employees to express their ideas that revolve on improving the auditing environment. In addition, there is a continues need to measure the support of their ideas with the used training factors.
2. The weighting process of the training factors should be updated periodically with the decision makers to improve them based on the changes of auditing environment.
3. Globalize the concept of the Youth’s events that focus on auditing and share its results internationally to gain the following benefits:
	1. Ability to measure the international trend of the training and learning factors that youth employees supports.
	2. Sharing its results will enrich the ability to adopt new ideas that improve the work and enhance auditor’s experience.
4. Enhance the link between the decision makers and the yearly training courses by considering the calculated weights of the training factors. Thus, training courses with higher support percentage will have a higher priority in the selection process.
5. Globalize the concept of weighting the training factors through creating a web application that permit building a unified model of the learning and training factors though following:
	1. Each country can define and update its set of learning factors and assign its own weights annually.
	2. Each country provides its opinion on the factors that were provided by other countries.
	3. Each SAI can provide an overall ranking for the global set of factors based on the SAI’s experience or taken by its decision makers.
	4. The application can identify the unique set of all factors and its several weights that were provided by different countries through different years.
	5. For study purpose, the system permits the process of extracting the complete dataset of factors and weights for all countries that approve on sharing their data.

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