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Follow on training with Rugby method type C applying fuzzy logic

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Abstract
In this work consists of a proposal for application in the monitoring process three fuzzy tools included in the planning of human resources training. Structured by a set of strategies that include a subset of diagnostic methods for training personnel at various levels of participation; plus a set of contingency analysis capable of displaying adversities and process knowledge gaps throughout the process; Finally, the implementation and follow-up that included the Rugby method type C with the application of three tools fuzzy analysis as against-expertons with media, about to the first experton pursache new experton, and finally, applying the multiplication of two expertons sets for one only (method Mamdani). The foregoing, applying the method of weighted Hamming Distance changed.

Keywords: training, fuzzy numbers, distance method, Mamdani method.

Introduction

This paper presents the methodology of strategic planning focused on the training of human resources. 1. Formed by conscience and the need to have good results under leadership well channeled, and investment needs in training Davenport (1999) [5]. and Needs staff by a new model change, Baldoni (2007) [2]. Sigismund *et al* (2002) [19]. 2. The methodology for conducting strategic planning function according to the set objectives, set of goals that operate on three levels, regulatory, strategic and operational. In addition to the contingencies, to display knowledge gaps Probst (2001) [17], carried out the implementation of training, then consider the valuation of training in monitoring scheme measured with against-expertons fuzzy numbers, Hamming distance method and application with Mamdani method. 3. Application case made in the company Quimic S.A. de C.V. 4. Conclusions. 5. Bibliography1.1. Driving change through training the structuring of workgroups with this idea of leadership development in the organization, surely give highly satisfactory results. So the model Davenport O. T. (1999) [5], either successful. To do this, you must have a full awareness of the change of mentality by workers and in accordance with Sigismund (2002) [19]. to make a change in the organization, must be a real awareness for the change to occur, without a "rebound" in a short time. According to the model Davenport O. T. (1999) [5], I believe that we should take into account the investment in training for staff growth and results in far for the organization.

In the training of the working groups at the beginning there is uncertainty about the new requirements and changes generated by new information received as a result of the training. For this reason and in accordance with Sigismund H. A. *et al*. (2002) [19]. in the process of changing from one scheme to be seen aspects of stress, and is involved with the source, assessment and moderation. Schemes be involved with operational activities of people. According Sigismund H. A. *et al* (2002) [19] should engender a settlement mechanism that allows entering the game, avoiding premature schema changes, since individuals are motivated to reduce any discord or tension, since the time need stimuli relatively isolated, so should not respond be a significant change Rather this settlement mechanism aims to reduce tension, but partially, with the participation of staff, so that prevents schema changes until you have accumulated the largest number of evidences. That the voltage level exceeds the level of inertia and start the change in the scheme. Rather this settlement mechanism aims to reduce tension, but partially, with the participation of staff, so that prevents schema changes until you have accumulated the largest number of evidences. That the voltage level exceeds the level of inertia and start the change in the scheme. [One way to evaluate these schemes propose to use change model change action cited by John Baldoni. According Baldoni J. (2007) [2] overcoming the resistance of employees and their evaluation by the human resource manager can use the model change action: $D * V * F > R$, where: D = force discontent with the status quo, V = vision of the future F = the need for action (the get started), R = resistance to change. The product of the force of discontent, vision of the future and the need to start will be greater to the resistance to change, so that may be a significant change in the organization, according to Baldoni J. (2007) [2]. The knowledge management trends have two perspectives, according Riesco G. (2006) [16], one has to do with information management through ICT. In which workers usually have training in computer and information science. Knowledge is seen as an object that can be identified and handled. The second trend is the people management. Researchers often have a humanistic education in psychology, anthropology, sociology or business. Your task is to assess the change and improve the skills and behavior of individuals.

Methodology- the structure of strategic planning

Objectives

Strengthening the system of training to reach staff improve their skills and thus have competitive opportunities that may be reflected in the value chain of the company. In this regard, the role of staff training can be described in the operating and intellectual development of staff that has to do with the whole project; with them the goals are met and consequently the objectives (O_i) Drucker P. F., Nakauchi I. (1997) [6]. thus continuous improvement projects will be obtained. Measuring knowledge targets can be measured through the model

alignment efforts such as: energy, sense of urgency focusing the voltage to generate the changes and fulfillment of goals and an important element, the values that should demonstrate its me presented by Probst G. (2001) [17]. The convenience of having harmonized goals and objectives in alignment with the mission, are supported with the metrics by which management measures performance, Baldoni J. (2007) [2]. Goals should provide the vision and mission, so that, experts-leaders must create alignment efforts such as: energy, sense of urgency focusing the voltage to generate the changes and fulfillment of goals and an important element, the values that should demonstrate its members in both word and deed, Tichy M. N. (2003) [12]. Investment in people as a means to accomplish the mission, is never defined. Managers and leaders (experts) should be clearly communicated and must also submit attention to your people, to care this investment, Baldoni J. (2007) [2]. Alignment is the axis between vision-mission and execution. As such, it is the strategic facilitator axis. Most organizations spend a lot of time focusing on strategic planning, development and description of tactical objectives that enable people to achieve the vision. To establish the three key issues of strategic planning (mission, vision and strategies) Sánchez Lima Ángel (2001) [18]. This instrument is used to measure the performance of human capital and is a key to achieving the vision, mission and strategies using five performance measures (financial Results, customer satisfaction, internal operating processes, creativity and skills development). The information system provides support to management control system in its mission to improve its competitiveness in the long term Mark A. T. (2008), O´Toole J. (1995) [11, 15].

Contingency

Experts should be aware that a major problem in the organization is the lack of knowledge and skills essential for the development of minimum activities to satisfy customers.

According Probst G. *et al*. (2001) [17], creating inventories of knowledge and transparency of knowledge are not an end in themselves. It only makes sense from the point of view of the objectives of the organization. The objectives must be oriented in the acquisition of knowledge as essential to strengthen human capital investment in the organization according to the model of Davenport (1999) [5].The interaction of the organization with the knowledge environment exposes internal knowledge gaps and deficiencies in skills. Can be evaluated the external sources of knowledge according to their contribution to the development of the expected competencies. The analysis of skills can also lead to the identification of best practices. This process also known as external comparative tests, the importance of benchmark tests can only close the vacuum 1, Probst G. *et al*. (2001)[17]. Sometimes just obtain sufficient learning of this type to build such skills difficult to imitate. The real challenge according to Probst G. *et al*. (2001) [17], is to fill the void 2 which is achieved through a range of activities that promote knowledge and research, market research, quality circles, etc.

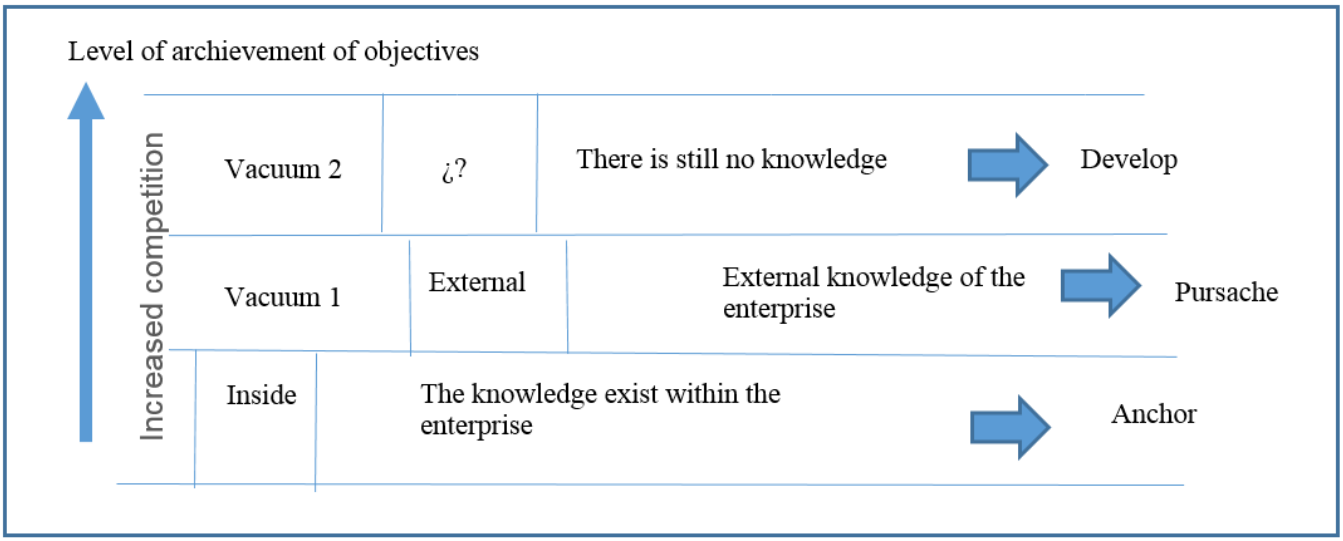

Fig1: Kinds of vacuum of knowledge. Source: Prost G. *et al* (2001).

Experts should promote through leaders who teach other staff the importance of responsibility. This measures the confidence and results.

Delegation is transfer: assignment of work and responsibility is made. This is the way in which it is responsible the people. Leaders need to be available to provide additional resources to support or at least in the form of advice and counsel.

Implementation

The introduction begins with communication and elements having variety in the organization as reorganize, merge and appointment of new managers or leaders. The level of delegation in assigning tasks to employees at another level, the delegation is to give responsibility and authority. Something very basic that is required to hold together, is communication; communication to provide information and invite participation. Leadership is about making other people to do what needs to be done Baldoni J. (2007) [2].

When the project leader is appointed, make sure, that the team knows who is responsible and who has the authority to make decisions. Moreover, the authority is making decisions based on the team, the team indicate that the leader is willing to share responsibilities and develop future leaders.

Leading the implementation

- The assignment involves assigning the right people to the right tasks. The action steps put plans into action. (Hungarian method with fuzzy logic).
- • Equipment Management. The alignments dictate the meeting of the masses for jobs, often the jobs are team efforts.
- • Self-administration gives the team a sense of autonomy and often enables teams to work very efficiently.
- • Communication is essential among team members and the team leader. Administrators can also interconnect with each other to collect resources and best practices.

Follow Up- application of fuzzy tools in monitoring

Direct and let go, according to Baldoni J. (2007) [2]. the administrator must trust its people with the responsibility and authority. As should be trusted to learn to step back.

Administrators need to share their experiences with each of the individuals, about to the issues involved, but more importantly builds bigger confidence levels across the organization. The main feature of the outstanding organizations lies in the strengthening of their process, through the analysis of frequency in the patterns and their memories, which enable then to structure the learning models.

According to Nonaka I., Takeuchi H. (1997) [14]. about to "The combination of the spiral of knowledge" is a process of systematization of concepts within a method, which involves a combination of explicit knowledge. [At this stage of monitoring is where the combination of knowledge which speaks Nonaka and Takeuchi applies also monitoring and supervision by experts; they must also run alongside trained as shown by the system Rugby type C within self-contained learning processes, so as to achieve the goals together as shown in Figure 2, to ensure that knowledge in part of training was brought to an end (temporal, and it never ends) as a subsystem that forms the macro system of strategic planning of the company].

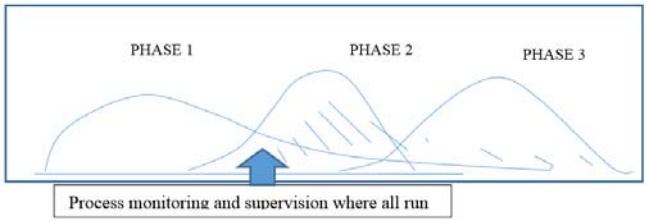

Fig 2: System type C. Source: Own calculations according to Nonaka and Takeuchi (1997).

Through academic experience knowledge acquisition and subsequently put into practice, such as the company invested in the theoretical part time will be essential to have knowledge bases well established that in practice it relatively easy. In this sense, the planning of the training program is divided into three phases, the first phase consists of the theoretical program that falls into the following two phases, the second phase II is the theoretical-practical and finally program, phase III is structured practical basis.

Expertons-It is important to consider the opinion of experts on the topic or features of the training of staff. For this reason, a group of internal expertise to the organization their estimates on the themes and/or features to evaluate, in a range of confidence between 0 and 1. The foregoing, is represented with expertons, which consists in calculating absolute frequencies in each of lower and upper bounds the role of membership, followed by the normalization statistical data using relative frequencies rising in each membership level, starting with the value of membership 1 to 0. The foregoing applies to each topic and/or feature of the training, represented in mathematical expectation, Kauffman A., Gil A. J., Terceño G. A. (1994). Complying with the following properties:

$\forall\, \mu \in [0,1]\ a_1(\mu) < a_2(\mu)$ (1)
$\forall\, \mu' \in [0,1]\ \mu' > \mu \Rightarrow\ a_1(\mu) \geq a_1(\mu')\ y\ a_2(\mu) \geq a_2(\mu')$ (2)
$a_1(0) = a_2(0) = 1$ (3)

Against-expertons-There are several methods for the application of counter-transdisciplinary approach adopted in this work we have chosen in two parts: the first with the valuation of group of experts (internal) and followed by the second valuation by another group of experts (external), based on the results obtained by the first. Valuations are made by each of the features of the trained area, in terms of individual mathematical expectation.

First method: Distance between expertones:

$$d(E[\tilde{A}], E[\tilde{B}]) = \frac{|e_1 - e_1^1| + |e_2 - e_2^2|}{2} \text{ (4)}$$

Thus, it can be approved or adjust the estimates of the first group of experts.

Second method: Now a second group of experts, takes the intervals of the mathematical expectation of the first group $E[\tilde{A}] = [e_1, e_2]$, and from there assigns the new estimates, according to the scale endecadaria, Kauffman A., Gil A. J., Terceño G. A. (1994):

0: $the\ value\ of\ e_1\ is\ correct$
0.1: $practically\ e_1$
0.2: $almost\ e_1$
0.3: $near\ to\ e_1$
0.4: $more\ near\ to\ e_1\ that\ of\ e_2$
0.5: $so\ close\ to\ e_2\ and\ e_1$ (5)
0.6: $more\ near\ to\ e_2\ that\ of\ e_1$
0.7: $near\ to\ e_1$
0.8: $almost\ e_2$
0.9: $practically\ e_2$
1: $the\ value\ of\ e_2\ is\ correct$

The estimates of the second group of experts i is $[\mu_i^1, \mu_i^2]$ function to the $E[\tilde{A}] = [e_1, e_2]$ of the first group:

$\mu_i^1 = e_1 + (e_2 - e_1)e_i^1$ (6)
$\mu_i^2 = e_1 + (e_2 - e_1)e_i^2$ (7)

With the foregoing, the against-transdisciplinary approach adopted, makes the learning function in the topics of training in the specific area.

Third method-(inference of Mamdani*)* the relationship between the first set of inside experts and second opinion with the

external experts, this is done through the multiplication of these sets to obtain a new set, which can establish the ideal profile of evaluation about to the process control for topics:$\in A'$ and $y \in B'$, In a similar manner to the general rule between two sets: $\mu(a,c) = \vee\left(\mu(a,b) \wedge \mu(b,c)\right)$, Gil Lafuente, 1997.
Therefore, we have:

$if\ x\ is\ A_1\ and\ y\ is\ B_1, then\ z\ is\ C_1, if\ x\ is\ A_2\ and\ y\ is\ B_2, then\ z\ is\ C_2, \ldots if\ x\ is\ A_n\ and\ y\ is\ B_n, then\ z\ is\ C_n = z\ is\ C'$ (8)

$R' = A' * B'$ (9)

$R_1 = A_1 * B_1 * C_1,\ \ R_2 = A_2 * B_2 * C_2, \ldots R_n = A_n * B_n C_n$ (10)

$C'_1 = R' * R_1, C'_2 = R' * R_2, .., C'_n = R' * R_n = C' = C'_1 \cup C'_2, C'_n$ (11)

With membership function:

$\mu_{C'_1}(z) = \ \mu_{A_1}(x_o) \wedge \mu_{B_1}(y_o) \wedge \mu_{C_1}(z), \mu_{C'_1}(z) = \ \mu_{A_2}(x_o) \wedge \mu_{B_2}(y_o) \wedge \mu_{C_2}(z)$

$\ldots \quad \mu_{C'_n}(z) = \quad \mu_{A_n}(x_o) \wedge \mu_{B_n}(y_o) \wedge \mu_{C_n}(z) = \quad \mu_{C'_n}(z) = \mu_{AC'_1}(z) \vee \mu_{C'_2}(z) \vee, \ldots$ (12)

As well, with the rules (i) to x and y:

$\mu_{C'_1}(z) = \vee_{x,y}\left[\mu_{R'}(x,y) \wedge \mu_{R_1}(x,y,z)\right]$ (13)

$$\mu_{C'_1}(z) = \vee_{x,y}\left[\mu_{A'}(x) \wedge \mu_{B'}(y) \wedge \mu_{A_i}(x) \wedge \mu_{B_i}(y) \wedge \mu_{C_i}(z)\right] (14)$$

$$\mu_{C'_i}(z) = \left\{\vee_x\left[\mu_{A'}(x) \wedge \mu_{A_i}(x)\right]\right\} \wedge \left\{\vee_y\left[\mu_{B'}(y) \wedge \mu_{B_i}(y)\right]\right\} \wedge \mu_{C_i}(z)\ (15)$$

Considering that, $A' = \{x_o\}\ y\ B' = \{y_o\}$:

$\vee_x\left[\mu_{A'}(x) \wedge \mu_{A_i}(x)\right] = \mu_{A_i}(x_o)$ (16)

$$\vee_y\left[\mu_{B'}(y) \wedge \mu_{B_i}(y)\right] = \mu_{B_i}(y_o)\ (17)$$

Therefore:

$$\mu_{C'_i}(z) = \left[\left[\mu_{A_i}(x_o) \wedge \mu_{B_i}(y_o)\right] \wedge \mu_{C_i}(z)\right] (18)$$

Distance method-The numbers of a fuzzy set that belong to the real numbers, which its normal function membership $\mu(x)$ and convex. In the process of measuring the distance of two sets with common characteristic, which are designed by the experts and the confidence interval of values to [0,1]. The characteristic that are valued by experts through a set such as:

$C = \bigcup_i^n c_i$ (19)
$c_i \in C$
$\mu_{c_i} \in \{0,1\}$

According to Kaufmann A., Gil, Aluja J. Terceño Gómez A. (1994) [7]. Gil Lafuente J. (2002) establish that the types most commonly used distance are Hamming, then absolute distance between two fuzzy sets $\underset{\sim}{A}$ y $\underline{B_j}$ in "*scale semantic endecadaria over to features specified*", Gil A. J. (1996) [8]. In this sense, applies the Delphi method to establish the best leaders, Dalkey N. *et al* (1972) [4], who by their experience set the parameters and factors to valuate. Expression in absolute terms, is as follows (Relatively):

$\nu\left(\underset{\sim}{A}, \underline{B_j}\right) = 1/n\ [\ \sum\ |(\mu_i - \mu_i^j|)]$ (20)

μ_i = Membership value assigned by experts (experton)
μ_i = Membership value obtained by trained personnel

About to the weighting into method of Hamming distance, the equation (20), we have modified to evaluate the performance of the departures of staff to the training system, which maximizes the distance obtained:

$\eta(T, P_j) = \frac{1}{v}\sum_{j=1}^{n} z_v \left|(0 \vee (\mu_T(c_v) - \mu_{P_j}(c_v))\right|$ (21)
$\forall\ v = 1, 2, 3, \ldots, m$
$T = persons\ training$
$z_v = fraction\ weighting$

The implementation of the method of fuzzy distance between of values of the membership of each of the individual, this difference is compared to zero, to choose the greatest among them, finally multiplied by the weighting. So the fraction weighting:

$z_i = \frac{w_i}{\sum w_i}$ (22)

The values of membership of the expert $\mu_{P_j}(c_v)$, the equation 21, are related to the means of transdisciplinary approach adopted for each topic/feature, Kauffman A., Gil A. J., Terceño G. A. (1994):

$\mu_p(e, \lambda) = (\sum_{i=1}^{n} \lambda_i e_i^p)^{1/p}$ (23)

$e = estimate = (e_1, e_2, e_3, \ldots, e_n)$

$$\lambda = (\lambda_1, \lambda_2, \lambda_3, \ldots, \lambda_n)$$

$p \in \mathbb{R}$

In the follow-up process Rughy type C, is considered the weighting in each of the three phases in the process of training (gaussian campaigns). In the first campaigns, the largest in area, which extends along the process until the intersection of the second and third campaign, to be assigned higher level of weighting, consequently, phases II and III will have a level of equal weighting to the importance that is considered to be adequate.

Evaluation

The best way to activate responsibility is to focus on results. Through continuous improvement may be strengthening the processes to find a number of ideas and ways of solving problems.

Case Aplicación

In the plant Quimic S.A. of C.V. through the human resources, production supervisors, superintendents maintenance, quality, sales and production with these groups develops expertons, or

a fuzzy subset for each phase and an academic group have put knowledge bases, requiring training area hydrolysis (splitting), which is divided into three stages, the three stages below where different analysis tools apply fuzzy described.
They comprise three phases of training and monitoring phase:

Phase I

a) Knowing the personal security measures, equipment, and the environment.
b) Knowing the different raw materials involved in the hydrolysis process and compatibility of these, according to their nature.
c) Knowing the chemical reactions involved in the process of hydrolysis
d) Meet the theoretical bases of containers under high pressure.
e) Understand and interpret readings of measuring instruments.
f) Learn the basics of managing computer.
g) Properly handle the thermal oil boiler recirculation.
h) To understand and interpret laboratory as fatty acid acidity according to the conversion of the reaction.
i) Evaluate staff in each of the objectives according to an ideal profile designated by experts and company executives

Phase II

a) Properly handle the pumping and distribution of raw materials and products.
b) Meet the restoration of equipment, control panels and electric drive.
c) Knowing the basic maintenance of positive displacement pumps, centrifugal pumps and pumps metal seal.

Phase III

a) Properly handle preheaters triglycerides and brine (220 ° C)
b) Properly handle the loading and unloading of autoclaves.
c) Operational decisions on their own, without any influence of another person.
d) Reliability operator in the form of equipment and actions regarding industrial safety.

Considering the efficiency of the training program, we considered the fuzzy valuation in range 0 to 1. According to the method of distance of Hamming for them is put in the first column objectives (table 1), followed by the expected results, Experton (a) and the following another expected results of the Against-Experton (b):

Table 1: The experton and agains-experton

Features	Experton		Features	Against-Experton
a	[0.72]		a	[0.72]
b	[0.58, 0.74]		b	[0.55, 0.91]
c	[0.63, 0.81]		c	[0.422, 0.71]
d	[0.6,0.8]		d	[0.56, 0.93]
e	[0.58, 0.71]		e	[0.62, 0.72]
f	[0.35, 0.63]		f	[0.433,0.92]
g	[0.41]		g	[0.299, 0.53]
h	[0.45, 0.71]		h	[0.599, 0.91]
i	[0.81, 0.91]		i	[0.76, 0.97]
j	[0.62, 0.84]		j	[0.55, 0.81]
k	[0.41, 0.64]		k	[0.58, 0.82]
l	[0.49, 0.73]		l	[0.57, 0.81]
m	[0.61]		m	[0.28, 0.52]
n	[0.56, 0.76]		n	[0.33, 0.83]
o	[0.55, 0.71]		o	[0.53, 0.82]
p	[0.57, 0.72]		p	[0.57, 0.87]

(a) First group (b) Second group

Table 2: The membership value obtained by trained personnel

Features	p1	p2	p3	p4	p5	p6	p7	p8	p9	p10
a	0.6	0.5	0.4	0.6	0.5	0.4	0.5	0.4	0.5	0.1
b	0.3	0.4	0.2	0.4	0.2	0.4	0.4	0.3	0.4	0.5
c	0.2	0.3	0.4	0.3	0.2	0.3	0.3	0.4	0.4	0.4
d	0.4	0.4	0.3	0.4	0.3	0.4	0.1	0.2	0.5	0.2
e	0.3	0.5	0.4	0.5	0.4	0.3	0.4	0.4	0.6	0.2
f	0.2	0.4	0.1	0.3	0.4	0.3	0.4	0.3	0.1	0.2
g	0.4	0.4	0.3	0.2	0.6	0.2	0.6	0.4	0.2	0.6
h	0.3	0.3	0.1	0.2	0.3	0.2	0.3	0.2	0.3	0.3
i	0.4	0.4	0.4	0.4	0.4	0.6	0.3	0.2	0.5	0.4
j	0.2	0.4	0.4	0.5	0.1	0.2	0.4	0.3	0.4	0.1
k	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.4
l	0.5	0.4	0.5	0.3	0.6	0.6	0.5	0.4	0.4	0.4
m	0.3	0.3	0.3	0.5	0.5	0.4	0.4	0.2	0.5	0.2
n	0.1	0.5	0.4	0.4	0.3	0.4	0.4	0.2	0.5	0.3
o	0.5	0.5	0.4	0.5	0.4	0.8	0.6	0.5	0.6	0.3
p	0.2	0.5	0.2	0.2	0.4	0.4	0.1	0.4	0.4	0.5

Weighning- The topics of the table 2: ***a*** to ***i*** will be assigned a weight of 0.5; while that for the topics of ***j*** to the ***l*** has a weight of 0.3; finally 0.2 for the rest; These weights were applied to the distance equation (21).

First method-In this case, applying the equation of Hamming distance (21) have values restraining the expected result approach and values which in turn represent the efficiency level of the training program.

Table 3: The prime valuation with penalizing does not reach the required and blurred away

	P_1	**P_2**	**P_3**	**P_4**	**P_5**	**P_6**	**P_7**	**P_8**	**P_9**	**P_{10}**
Remoteness $\tilde{A}^1$	0.2044	0.1449	0.20969	0.1713	0.18967	0.177	0.16792	0.22	0.1454	0.237
1- $\tilde{A}^1$	0.7956	0.8551	0.79031	0.8287	0.81033	0.823	0.83208	0.78	0.8546	0.763

Therefore, the program has an average efficiency: $\eta = \frac{\sum(1-\tilde{A}_i^1)}{n} 100 = 81.3272\%$ above to minimum value.

Table 4: The second valuation with penalizing does not reach the required and blurred away

	P_1	**P_2**	**P_3**	**P_4**	**P_5**	**P_6**	**P_7**	**P_8**	**P_9**	**P_{10}**
Remoteness $\tilde{A}^1$	0.2004	0.1994	0.23128	0.2713	0.23239	0.16	0.14489	0.19	0.231	0.17
1- $\tilde{A}^1$	0.7996	0.8006	0.76872	0.7287	0.76761	0.84	0.85511	0.81	0.769	0.83

In the second valuation in the against-experton function there is average efficiency of 79.6934%.

Second method- Now considering the new allocation (themes/features) on the part of the second group of service providers are based on the hope mathematics of the first group of experts. The calculations are made in a manner similar to the previous:

Table 5: The prime valuation with penalizing (second method)

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
Remoteness $\tilde{A}^2$	0.305	0.2418	0.312	0.2685	0.279	0.2678	0.264	0.321	0.237	0.336
1- $\tilde{A}^2$	0.695	0.7582	0.688	0.7315	0.721	0.7322	0.736	0.679	0.763	0.664

Therefore, the program has an average efficiency: $\eta = \frac{\sum(1-\tilde{A}_i^2)}{n} 100 = 71.679\%$ above to minimum value.

Table 6: The second valuation with penalizing (second method)

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
Remoteness $\tilde{A}^2$	0.355	0.2926	0.363	0.3192	0.3298	0.3163	0.315	0.372	0.288	0.387
1- $\tilde{A}^2$	0.645	0.7074	0.637	0.6808	0.6702	0.6837	0.685	0.628	0.712	0.613

In the second valuation in the against-experton function there is average efficiency of 69.621%.
As you can see, there is a difference between the two methods, due to that, the second becomes more demanding by the allocation that affects every one of the hope mathematics of item/feature assigned by the first group.

Third method- the relationship between the first set of inside experts and second opinion with the external experts, this is done through the multiplication of these sets to obtain a new set:

Table 7: The lower estimate with penalizing (C = A*B)

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
Remoteness $\tilde{C}_{inf}$	0.213	0.1515	0.22	0.1754	0.1997	0.19	0.177	0.228	0.148	0.243
1- $\tilde{C}_{inf}$	0.787	0.8485	0.78	0.8246	0.8003	0.81	0.823	0.772	0.852	0.757

Therefore, the program has an average efficiency: $\eta = \frac{\sum(1-\tilde{C}_{inf})}{n} 100 = 80.544\%$ above to minimum value.

Table 8: The over-estimate with penalizing (C = A*B)

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
Remoteness $\tilde{C}_{sup}$	0.382	0.3188	0.389	0.3454	0.356	0.3411	0.341	0.398	0.314	0.413
1- $\tilde{C}_{sup}$	0.618	0.6812	0.611	0.6546	0.644	0.6589	0.659	0.602	0.686	0.587

In the second valuation in the (C = A*B) function there is average efficiency of 64.017%.

Conclusions

We have presented a proposal of fuzzy tools to obtain results of optimization in training staff. For individuals who are trained as operator of the hydrolysis process (case of application), which intervenes diffuse tools (monitoring and evaluation). It was considered the valuation of the objectives of planning, being those who give direction to employees of the organization to meet the goals in the organization and the resources that are available to get to consolidate a perspective view of change. In this sense, we can conclude that applying the some tools allows us to know the scope of the training program at the same time, as a key element start when there is uncertainty about the fulfillment of purpose and goals; in the case of the application of the fuzzy tool, the method of modified Hamming distance (Criminalize the does not reach the ideal profile), which focuses on the application of tests to workers according to their skills and thus evaluate the removal according to the ideal profile formulated by experts through experton; with the multiplication of two fuzzy sets (third method: maxmin) we realize that there is a widening gap of the employees at the new ideal profile, especially in the $\tilde{C}_{sup}$. The implementation of three diffuse tools enable us to understand the degree of training program in environments of uncertainty.

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