Flow Diagram Design in Problem Solution: Sample of Authorization Process for Cabin Services

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Abstract

Increase in stakeholder expectations and increasingly complex organizational structures encourage managers to use more systematic and scientific methods for problem solving in decision-making processes. Professional authorization for managers of aviation education institutions is an important element in providing qualified human resources, which is the biggest expectation of the sector stakeholders. The complex structure of the authorization process created in line with the instructions of the national and international aviation authorities and its close relationship with frequently renewed legislation confronts managers with problems in process management. Flow diagrams are a managerial problem-solving technique that enables activities to be defined and structured and developed. In this study, the design of the cabin crew basic training authorization work flow diagram, which is not yet available in the literature, has been designed by making use of expert opinions and experiences under the guidance of legislation. It is thought that the diagram will simplify the complex structure of empowerment, guide the organizations that will enter the process and the audit activities of the civil aviation authority, and will benefit the managers of the resources in resource planning.

Keywords: Aviation education management, Problem solving, Flow diagram, Management and strategy, Quality management

Introduction

Organizational life contains many problems. In fact, it can be seen that the problems are opportunities to improve the existing situation. Organizational problems are seen as factors that prevent performance from increasing or achieving the intended success until we realize them. With the realization of their existence, the process of defining the problem, which is accepted as the first stage of the problem solution, begins. The possibility that any organization may have encountered and resolved the problem that has arisen before, and moreover, has developed a systematic that includes preventive measures or alternative remedies for this current problem, and this often guides researchers or practitioners from problem solving. they are formed as a result of cumulative accumulation they acquire as a result of active use of their skills.

The increasingly complex structure of their organizations and increasing stakeholder expectations make managers more compulsory to use modern problem-solving techniques than before.

Because, under increasing competitive conditions, it becomes clearer that the decisions to be taken have great results that cannot be achieved through trial and error, and above all, cause the resources not to be used effectively.

Obtaining authority approval in terms of professional competence is an important issue in terms of institutional reputation allocation for managers of educational institutions, like all organizations. Managers need to make a new decision with each step when managing their authorization processes, which significantly affects the use of other processes or available resources over the long term. For instance, a step earlier than necessary in the employment of personnel prevents the efficient use of available resources, or skipping a step such as internal audit during the authorization process may bring loss of reputation along with the loss of authority. For this reason, managers should evaluate the problems that will emerge in their authorization processes, which will provide corporate reputation gains, as in all management activities, through scientific problem solving techniques and create their decisions in line with this basis.

Authorization processes of aviation education institutions worldwide are carried out by the relevant local authorities in line with the guidance of international institutions such as ICAO, EASA, IATA. In our country, aviation training authorizations are carried out in accordance with EASA and SHGM instructions. The complication of the authorization processes in the face of frequently changing legislation is challenging for those who manage the process, and the problems are increasing at the point where the lack of authorization is based on an institutional system and the loss of experienced personnel. In this study, a flow diagram, which is one of the problem solving methods for cabin services training authorization process, is designed to guide the relevant organization managers in business management processes and at the same time, to make the necessary arrangements by seeing the processes that need to be renewed and improved more clearly.

Problem Solving Techniques In Management

Organizational problem, the obstacle that stops, slows down and deflects the organization from achieving its goals (Basaran, 1993); Difference status between expected situations or results and actual situations or results that decrease organizational effectiveness, but does not jeopardize the existence of the organization (Dincer, 1985), the difference between a target determined and desired to be reached during the study and the current situation of the employees (Hunley & McNamara, 2010) ; It can be defined as the obstacles (Nezu and D'Zurilla, 2007) that they encounter on the path they have determined during the efforts of the institution to reach their goals.

Problem solving is conceptually, when the outcome is uncertain, a cognitive quest to achieve the correct result (Martinez, 1998), finding the best way to overcome the obstacle encountered (Morgan, 1999), correcting the difference between where something is now and where it should be. The process (Kneeland, 2001) is expressed as a process of transforming certain conditions into another preferred state (Stevens, 1998) or a process that requires a series of efforts to eliminate the difficulties encountered in achieving a certain purpose (Bingham, 2004).

Especially in the management of business processes, the solution of the problems that arise can be considered as the process of finding the right way to reach the target from uncertain situations. Researches on how the problem solving process will be are mostly referring to Osborn and Parnes' creative problem-solving model consisting of 6 stages. (1.Objective Finding, 2. Gathering Data (Fact Finding), 3. Problem-Finding, 4. Idea Finding, 5. Solution Finding (Idea Evaluation), 6. Action Finding (Idea Implementation). The first and most important step in problem solving is to show the aim and therefore the ability to define the problem correctly. We have determined two goals that raise completely different questions and solution methods, at which point the definition of the target and the problem indirectly is seen as the most important step as it will affect the solutions of all other steps.

In order for the problem to be solved correctly after the goal is cleared, all ways to provide data, information and possible materials should be investigated. As the studies for collecting information progress, new views will emerge that will help solve the problem and provide a better understanding of the problem (Bingham, 1971). Regarding the authorization processes, firstly, the relevant legislation and manager responsible for education in various aspects, trainer, industry stakeholders auditor, etc. expert opinions will be the main source of information.

The problem-finding phase involves creating a specific problem statement specific to our purpose. (What is the problem to focus on?) In the first step, the purpose that will lead us to the question has been determined. Here, the best problem is chosen from the various problem statements related to the purpose determined through the information obtained.

The last two stages are finding ideas and solutions. There is only production in the producing of ideas, choice was

beside the point yet. It is aimed to generate as many ideas as possible. Thus, more solutions can be determined. No reasonable solution should be overlooked. (Bingham, 1971). In finding solutions, it is aimed to choose the most appropriate one of the ideas obtained. Assessment ensures that all forms of solution are considered in all their aspects, and that the possible outcome and effect of each solution will be predicted in advance. The best solutions found are put into practice and evaluated (Bingham, 1971). (What are the steps to be taken to implement the solution?)

It can be said that the most important contribution of the problem solving process to organizations is to put problem solving in a structured approach and to create more and more solutions by sharing more participants in the sharing of ideas to evaluate convergent / divergent approaches. (Stevenson, 2017)[1]

The purpose of using techniques that make problem solving applicable to organizations is to implement practices that will enable organizations to overcome the obstacles they encounter in achieving their goals with scientific techniques and systematics. Brainstorming, Gordon Technique (Sinective), Six Thinking Hats, Fishbone, 5ws1h, Morphological Method, TRIZ and flow diagrams that are the focus of our study are examples of some problem solving techniques used in the solution of organizational problems.

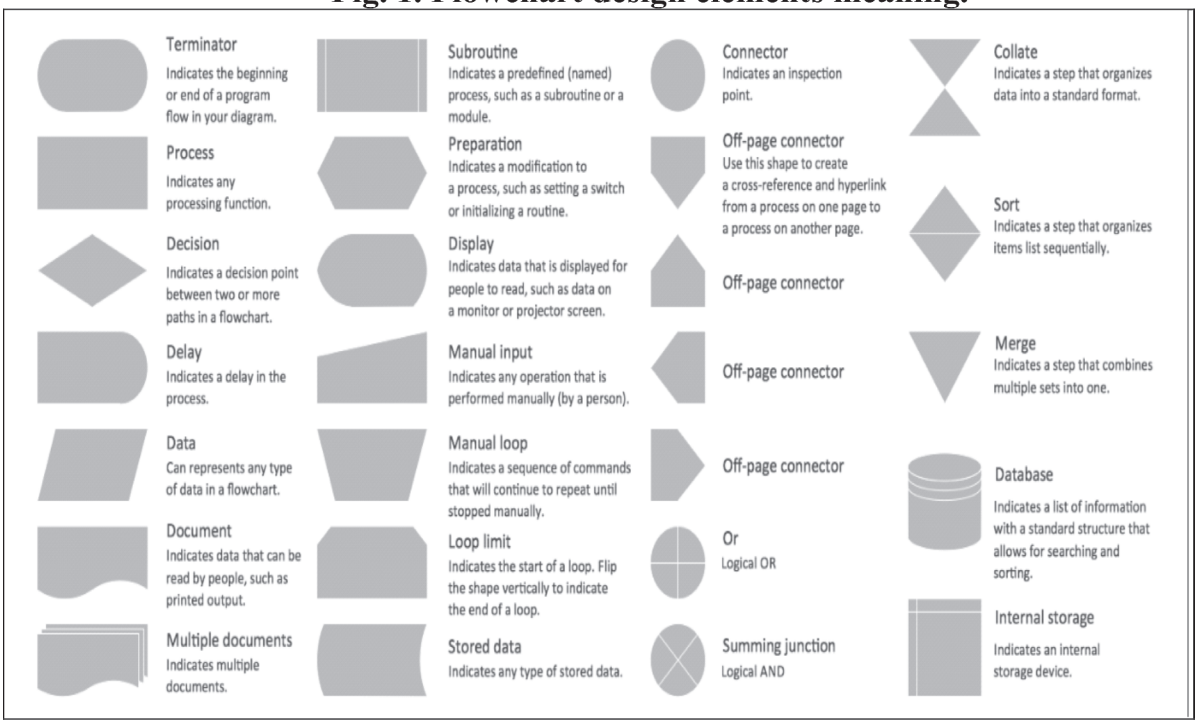
Flow Diagram

Flow diagrams are the visual representation of the algorithms, which are formed by expressing the arithmetic and logical steps that must be followed in order to solve any problem by word or text. The difference of the flow diagram from the algorithm is that the steps are written into symbols in figures and the relationships and direction between the steps are indicated by arrows. They are used to determine the real and ideal paths followed by a product or service to identify deviations in the process. In the flow diagram, all stages of the process are visually represented by signs or symbols. (Taptık, 1998) Each process is defined by geometric shapes and each shape is connected by arrows (Tonchia, 2004)

Thus, the individual who will participate in the process can know what to do between the beginning and the end of the process, what stages to go through and have a general guide about possible ways. (Cetin, Akın & Erol, 1998) By examining the diagrams, cycles that are the potential source of the problem can be revealed. It can be applied to all kinds of fields such as flow diagrams, material flow and production process steps (Taptık, 1998)

Flow diagram symbols are determined by the American National Standards Institute (ANSI) and are used worldwide in accordance with this standard. (Fig. 1)

Fig. 1. Flowchart design elements meaning.



Flow diagrams arising from algorithm analysis in mathematics and computer science are among the methods used by businesses in problem solving in terms of quality management and strategic management. The aviation management examples of this method, which is frequently used in the literature with elements such as workflow, process management, value flow, are as follows:

In their study on aviation education management, Bostick and Booth (2005) analyzed naval aviator training to reduce the inefficient training period. It provides an analysis of training models that reveal flaws and inefficiencies related to resource allocation and lead to time loss for aviation trainees. They offer a decision support system prototype that includes better solutions to resource allocation through the Naval aviation training flow diagram and reduces the inefficient training time.

Eker (2005) benefited from work flow diagrams in order to create all documents and materials that helicopter companies have to prepare in accordance with the instructions of the competent authority in order to start their activities or to continue their existing activities. In order to create a standard guide for all users in the aviation industry, the steps to be taken in all activities of the helicopter companies are determined by a standard flow diagram, and the steps to be followed are determined with a work flow diagram.

Arusoglu (2010) has developed a simulation proposal for testing capacity and competence requirements at airports, analyzing the space relations in the terminal building, and created arriving and departing passenger flow diagrams.

In her study, Kahya (2010), by examining the developed countries in the field of space and aviation research laboratories, proposed a civilian and a military model. Decision-making authorities and solutions to be followed in these models are expressed through Space and Aviation Technology R&D process flow diagrams.

Plioutsias and Karanikas (2015) have developed a control flow diagram that includes control actions and feedback mechanisms that can be used by the lead pilot, based on aircraft guides, during (Air combat manoeuvring) / Air combat maneuver.

Inan (2015), in his study, developed the flight test instructions that should be performed on the aircraft after the CN-235 being subjected to maintenance at different levels, in a template format that includes all stages of maintenance. As a result of his work, flight test instructions have been turned into a set of concrete, traceable instructions within the framework of a flow diagram.

Yılmaz and Yazgan 2017 have created a flow diagram to guide maintenance and training organizations in the use of resources in the aviation industry, taking into account national or international regulations regarding the authorization of aircraft type rating training.

No studies on the management of the authorization processes of civil aviation cabin services training institutions were encountered, and in this study, the literature examples mentioned in the aviation focus were taken into consideration, especially the authorization processes of aircraft maintenance enterprises.

Cabin Services Authorization Process And Flow Diagram Design

Civil aviation is a sector where risk factors arising from human error are high. For this reason, the need for qualified human resources is one of the important elements of the civil aviation industry that must be managed well. Managing this risk is possible only by increasing the competencies of the employees through the quality of the training they receive.

Cabin crew; they are qualified people who are obliged to provide flight safety, security and comfort by acting in accordance with the quality, flight safety standards, operating instructions and international civil aviation demands of the airline they work with. (Aktunc, 2013). These people, who have the responsibility of providing flight comfort and safety in accordance with international standards, can only start their duties if they have successfully completed their basic training and are certified.

Cabin Crew Basic Training is a training program designed for cabin crew candidates and covers all kinds of emergencies that they may encounter during their duty (SHGM 2013).

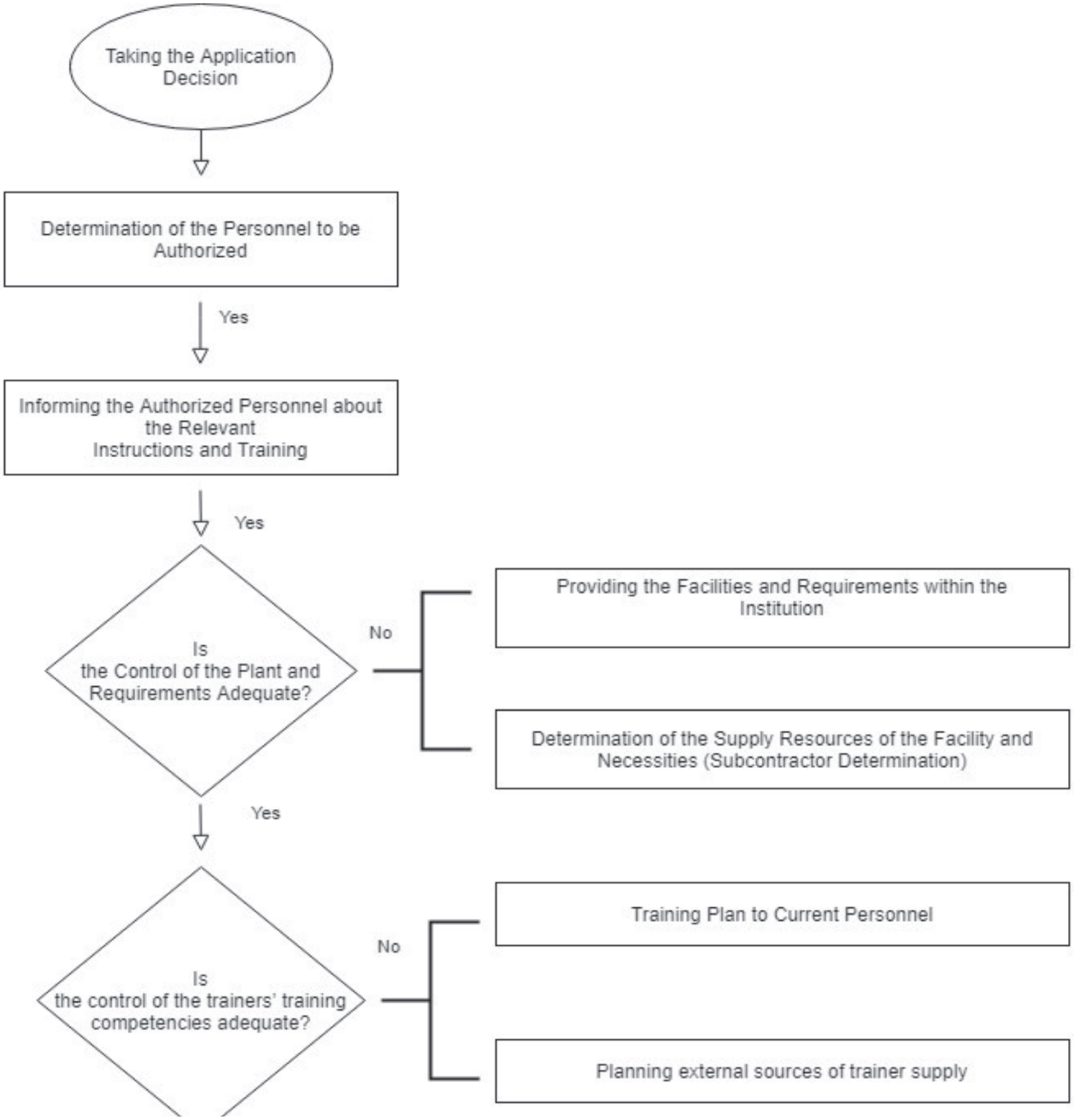
In our country, cabin crew certification is given by SHGM. The "Cabin Crew Instruction" (SHT-CC) determines the minimum qualifications that cabin crew members to be certified must have and sets out the procedures and principles regarding the issuance, validity and use of basic cabin certifications (SHGM, SHT - CC).

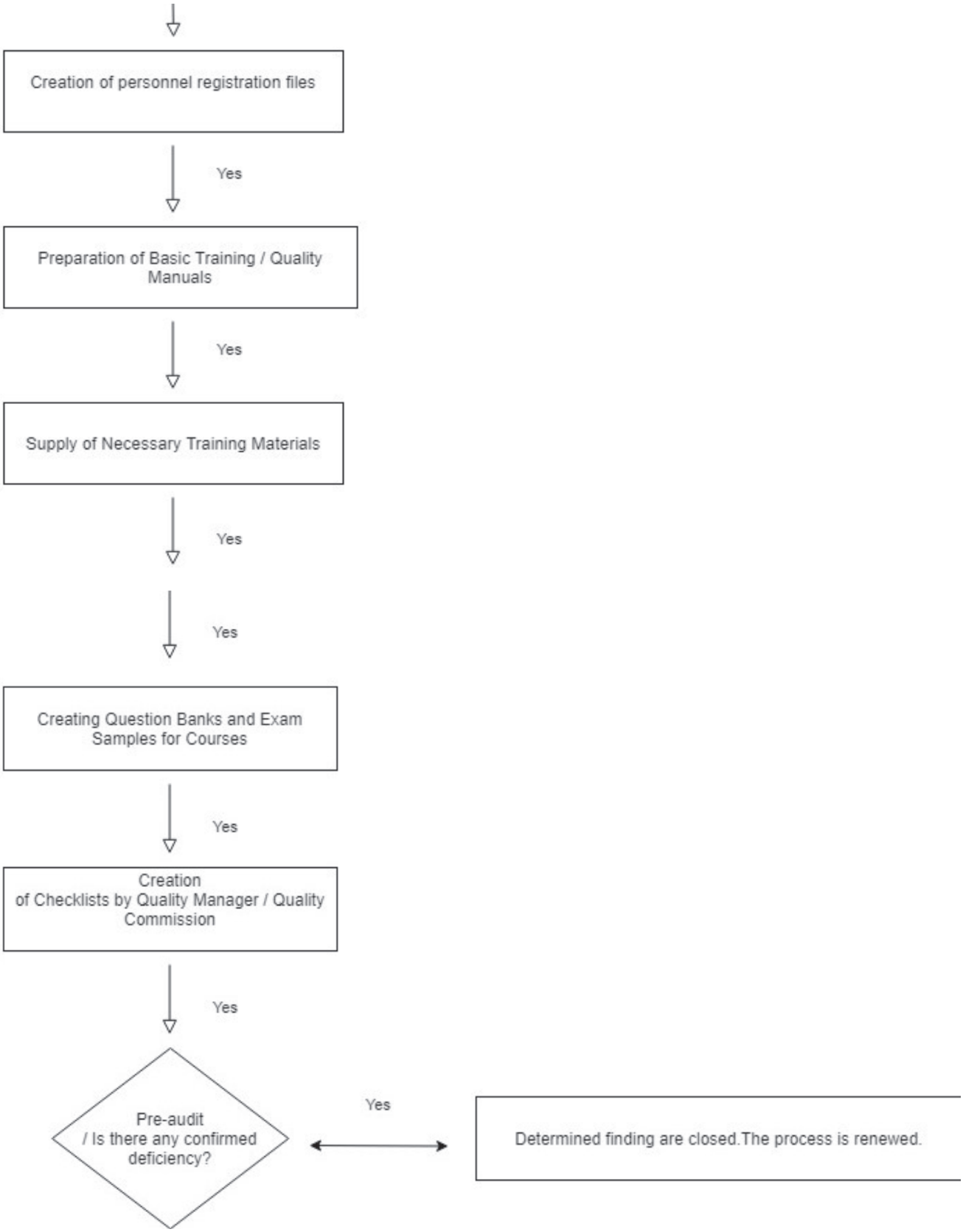
The procedures and principles regarding the authorization, suspension and cancellation of the Cabin Crew Basic Training Organizations by SHGM, which will provide basic training to the cabin crew, are included in the Cabin Crew Basic Training Organizations Instruction (SHT-CCTO)[2].

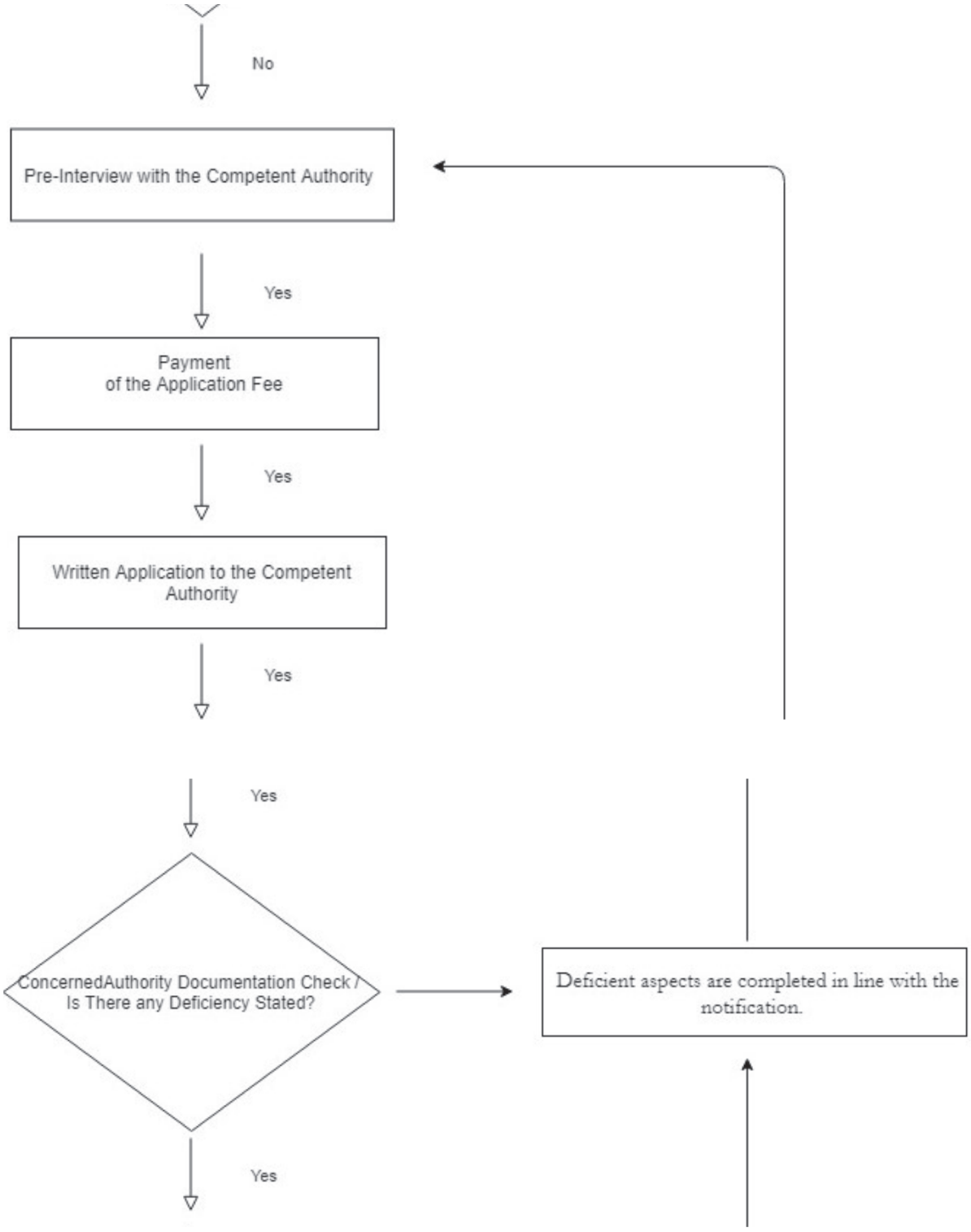
In addition, in B.11.1.SHG.0.14.03.26 / 697-3898 numbered "Circular Regarding Providing Basic Safety Training for Cabin Crew", explanations about the basic

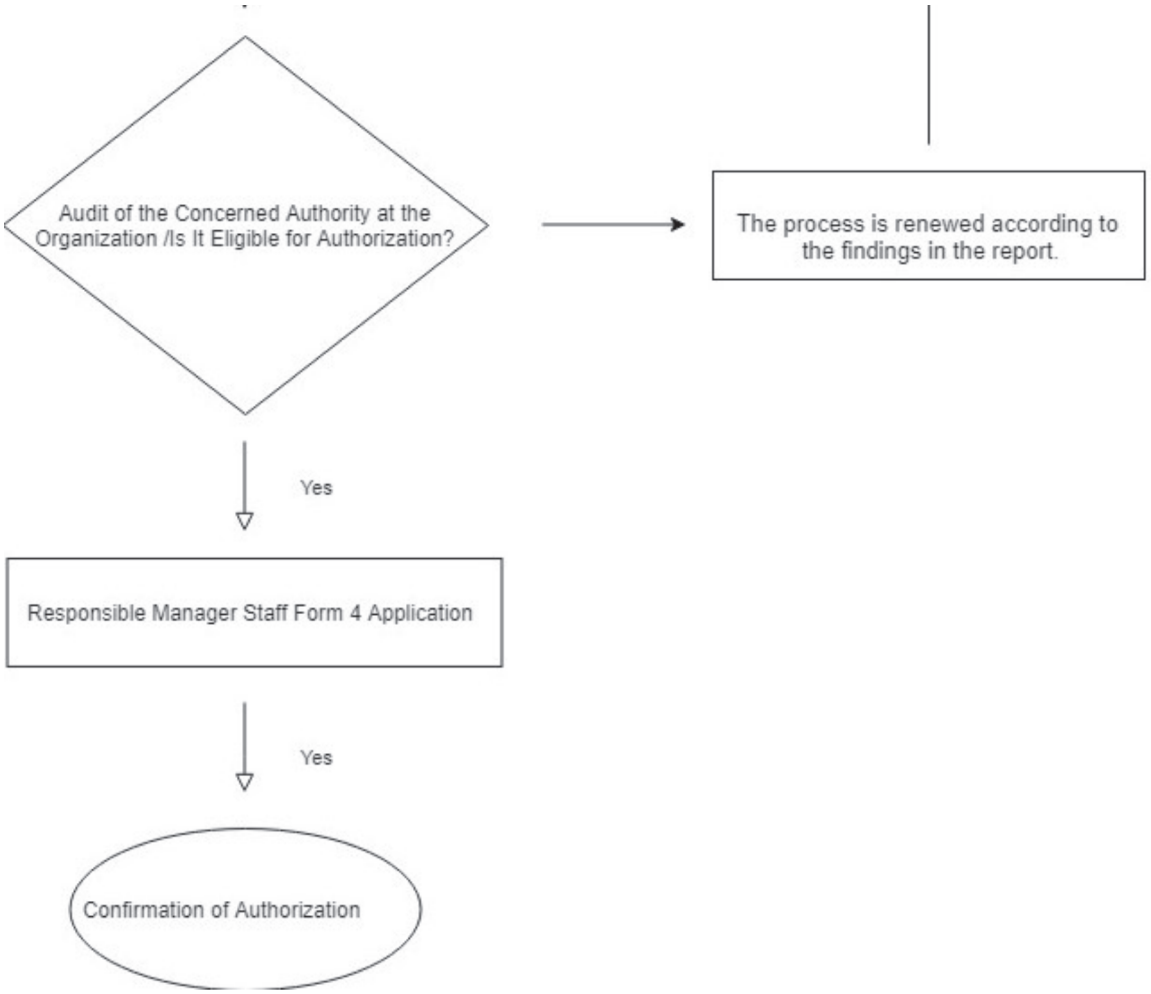
qualifications that the authorized training institutions should have are provided.

The complex structure and frequent updating of the legislation confronts educational institutions with various problems in authorization, and create confusion about the procedures to be followed and the resources that must be fulfilled in which order and which resources to be openeed. In this study, from the University of Turkish Aeronautical Association- Civil Aviation Cabin Services Program, which has completed the authorization processes, the opinions of the managers and trainers responsible for education have been received, and the legislation has been examined and the procedures to be followed have been reflected in the flow diagram design[3].




Creation of personnel registration files
Yes
Preparation of Basic Training / Quality Manuals
Yes
Supply of Necessary Training Materials
Yes
Yes
Creating Question Banks and Exam Samples for Courses
Yes
Creation of Checklists by Quality Manager / Quality Commission
Yes
Pre-audit / Is there any confirmed deficiency?
Yes
Determined finding are closed.The process is renewed.


No
Pre-Interview with the Competent Authority
Yes
Payment
of the Application Fee
Yes
Written Application to the Competent Authority
Yes
Yes
ConcernedAuthority Documentation Check / Is There any Deficiency Stated?
Deficient aspects are completed in line with the notification.
Yes



Step 1: Taking the Application Decision for the License

The decision of authorization for the training program to be taken by the institution managers.

Step 2: Determination of the Personnel to be Authorized

It involves determining the personnel to take on the duties; the Managing Director, Chief Academic Officer, Conformance Monitoring Manager etc.

Within the scope of SHT-CCTO, Cabin Crew Basic Training Organizations should employ qualified and competent personnel who can effectively manage their training processes depending on the number of trainees.

To work directly under the Managing Director;

1) Manager Responsible for Cabin Crew Basic Training,

2) Safety Management System Manager,

3) Conformance Monitoring Manager,

Personnel should be selected among those with the necessary qualifications within the framework of the relevant legislation. For example; the qualifications required by Chief Academic Officer are expressed in the circular numbered UOD2019 / 1. (Having at least 10 (ten) years of working experience as a cabin crew member in the civil aviation sector, etc.).

Step 3 Dominance of Authorized Personnel to the Related Legislation

All organizations requesting authorization should establish a system in which SHGM can follow the rules published by it. It is a requirement that the assigned officials have a command of the legislation (SHT-CC, SHT-CCTO, IR, AMC, GM, Circular Regarding Providing Basic Safety Training for Cabin Crew).

Step 4 Control of Plant and the Requirements / Is It Adequate?

It includes that of checking the plant requirements for

classes, trainers and trainees, working and resting areas, toilets, management offices, plant capacity, ensuring that the plant is adequately lit, ventilated and free from outside noise and distracters, etc. If all the requirements cannot be met by the organization, a subcontractor can be determined.

The educational institution can make an agreement with another educational institution provided that it has fulfilled the standards and requirements. If the training takes place in another facility and / or environment, it is responsible to conduct a detailed compliance inspection process (SHT CCTO) to ensure that the required standards are met in this facility and / or environment. In this case, a list of the facilities that will be utilized for training, (Swimming pools, aircraft training tools), the sample of the contract with the supplier regarding the use of the facilities should be prepared. (CEET, CST)

Step 5 Control of Personnel Training Competencies / Is It Adequate?

Adequately qualified trainers should be employed to ensure the quality, reliability and continuity of the training to be provided. Examples of qualifications to be sought for instructors within the framework of the relevant legislation are as follows:

Having valid certificates or certificates of participation in the subjects to be trained b. Having worked in an aviation organization or aviation training institution for at least three years in relation to the subject to be trained c. Among those who do not have PhD; university graduates from faculties of education or received initial teacher training or have training of trainers certificate (Circular on Providing Basic Safety Training of Cabin Crew)

Having valid certificates or certificates of participation on the subjects to be trained, b) Having DGR trainer certificate on Hazardous Material Rules, c) Having CRM trainer certificate on Team Resource Management, ç) Having valid security trainer certificate in modules defined under SHT 17.2 Instruction on security training, d) Having a certificate of first aid trainer approved by the Turkish Republic Ministry of Health, e) If s/he will provide training on flight operation, having worked in the aviation organization for at least three years as a cabin crew member (cabin attendant or purser), f) Those who do not have a PhD; university graduates from faculty of education or received initial teacher training or have training of trainers certificate (SHT CCTO).

If the current personnel do not meet the qualifications, a training plan should be made to be subjected to training or external sources of trainer supply should be specified.

Step 6 Creating Personnel Registration Files

The Trainer Registation File containing the information and documents regarding the past experiences of the trainers should be created, and the training of the trainers requiring refresher training should be included in the training planning process.

Step 7 Preparation of Basic Training / Quality Manuals

The Basic Safety Training Program Manual should be prepared, which includes theoretical and practical training topics related to the national legislation and international standards regarding the service provided and which will be prepared within the scope of SHT OPS 1 Instruction and ICAO Doc 7192AN / 857 Part E-1 Training Document (Circular Regarding Providing Basic Safety Training for Cabin Crew).

Also in the Quality Manual: 1) Quality control / audit procedures, 2) Change of trainer procedures, 3) Trainees' evaluation processes, procedures to be followed in case of failure, 4) Organization schema, management personnel and trainer CVs 5) Thereby the change procedures to be stated, the information regarding the changes regularly being controlled should take part (CCTO).

Step 8 Supply of Necessary Training Materials

Adequate arrangements should be made for the standardization of trainers and the necessary equipment should be provided for the training by the management personnel responsible for training. (Oxygen mask, life jacket, first aid kit etc.)

Step 9 Creating Question Banks and Exam Samples for Courses

A question bank should be created for each training module. Question bank revision period should be defined in the Cabin Crew Training Manual.

Step 10 Creation of Checklists for Pre-Audit by Quality Manager / Quality Commission / Quality Control Internal Audit Processes

Necessary for the systematic monitoring and periodic auditing and reporting of the activities performed and the products / processes supplied / contracted, compliance with the relevant national / international legislation and internal procedures, and for the evaluation and monitoring of the adequacy of the measures and corrective actions taken or to be taken in order to eliminate the determined nonconformities. It includes all the processes that define the organizational structure, responsibilities, procedures, training and qualifications and are carried out as a basic function of the Management System.

Step 11 Is there a pre-audit / a deficiency?

Within the scope of the Institution's Quality Management system, the control of the application documentation is realized by the compliance monitoring manager and members of the quality commission.

Step 12 Pre-Interview with the Competent Authority

Training institutions that will apply for training authorization approval should first discuss the details of the approval process with the General Directorate official. The official application to be made after the pre-interview is made to the Flight Operations Department Flight Operations Management.

Step 13 Payment of the Application Fee

Along with the application form, the application fee must be paid at the fee specified in the tariff of service published annually by the General Directorate at www.shgm.gov.tr. Applications without a receipt regarding the payment made are not evaluated by the General Directorate. The tariff of service is available at http://web.shgm.gov.tr/tr/hizmet-tarifesi/4007-hizmet-tarifesi.

Step 14 Written Application to the Competent Authority / Submitting an Application

The organization submits the pre-application letter containing information on the preparation of the first application, the creation of the necessary documents and the review of these documents, to the General Directorate. (After the completion of all preparations and studies by the educational institution, the application file containing the requested information and documents is submitted with the application form named Form1703 to the General Directorate for evaluation.)

Step 15 Concerned Authority Documentation Check / Is There A Deficiency?

The training authorization request file sent by the applicant is examined by the General Directorate. Due to the inadequacy of the information presented as a result of the review, the applicant is notified in written within 60 working days at the latest on the grounds of deficiencies and / or unsuitable issues.

Step 16 Audit of the Concerned Authority at the Organization / Is It Eligible for Audit?

If the application of the educational institution is considered appropriate by the General Directorate, all processes related to the educational institution and all educational facilities are inspected by the auditors of the General Directorate in order to determine if the conditions are met. The audit in question is carried out within the SHT Audit Instruction.

Step 17 Appointment for Responsible Manager Staff / Form 4 Application

The process will be started by submitting the documents required for the administrative candidate personnel to be proposed by the organization in accordance with the relevant legislation in the application file and sent to the General Directorate (Circular Gm - 2015/1).

Step 18 Confirmaton of Education Authorization

If the audit is successful, the General Directorate approves that the training institution can carry out the training program and an authorization certificate is issued to the relevant training institution.

Conclusion

The increasingly complex nature of today's organizations encourages managers to use more systematic and scientific methods for problem solving in decision-making processes. Except for ordinary problems such as new competitors entering the sector, funding or customer loyalty, the need for creative problem solving skills of managers becomes more evident when unforeseen, unexpected problems arise. New problems can be solved in a healthy way with new approaches, which often arises from the ability to see different extensions of this information, rather than completely ignoring the existing information. Even in many cases, problem solving comes from the restructuring and development of currently used perspectives or processes.

Flow diagrams are one of the managerial problem-solving techniques that enable organizations to restructure and improve processes by defining their activities. In the realization of the activities, they are used for preventing the unnecessary repetitive steps, insufficient control or timely resources used by determining the processes to be followed at each step, their interactions with each other, and possible risk factors. The main benefit they provide to businesses is time and resource savings.

Like all managers, aviation training organization managers are also in an effort to create optimum benefits from available current resources. Authorization by the authority is important in terms of the corporate reputation that the manager tries to provide, and managers can only achieve resource optimization in this process by using problem solving and decision- making systematics effectively. Taking account of the fact that aviation activities are carried out with the instructions specified in the national and international standards, it is considered that the flow diagram, which is designed under the guidance of the

legislation, based on expert opinions and experiences, will guide the organizations that will enter the licensing process and the audit activities of the civil aviation authority. The diagram will simplify the complex structure of the licensing process, and will benefit managers in corporate resource planning that encounter process management problems.

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Endnotes:

1 Divergent process requires different alternatives, perspectives, and remote conceptual connections from the information available; The convergent process implies that different ways of thinking are based on common ideas in a single solution.

2 The draft instruction published in the article preparation process was also taken into consideration.

3 In flow diagram design, diagrams.net has been used