

# AFROSAI-E

## Guidelines on Performance Audit of Waiting Time



AFROSAI-E Copyright  
2008

## PREFACE

AFROSAI-E has declared performance audit as a strategic imperative and decided on a very ambitious goal for the development of performance audit within the region. The organisation will achieve this by supporting SAIs with training, production of training material, website development, quality assurance visits, etc.

The General Auditing Standards of INTOSAI<sup>1</sup> stipulate that each Supreme Audit Institution (SAI) should adopt policies and procedures to prepare manuals and other written guidance and instructions concerning the conduct of audits. AFROSAI-E has already developed a general manual on performance audit. As a continuation of this work, the organisation has decided to develop concrete guidelines for specific audit problems that are often the object for performance audits. These guidelines on waiting time audits are the first in this series of guidelines.

The guidelines were developed by a working group consisting of Mr Gorden Kandoro, Zimbabwe and Mr Hans Noaksson from our institutional partner, the Swedish National Audit Office, in cooperation with Lennart Widell from the AFROSAI-E Secretariat. A number of performance auditors from our SAIs have commented on drafts of these guidelines.

I do hope these guidelines will assist SAIs in carrying out performance audits on waiting time. I am sure they can also be of help when cutting production time for the SAIs own audit reports. If you have feedback on the guidelines or suggestions for new topics in this series of guidelines you are welcome to contact the AFROSAI-E Secretariat.

Lennart Widell  
Performance Audit Manager of AFROSAI-E

---

<sup>1</sup> International Organisation of Supreme Audit Institutions.

**TABLE OF CONTENTS**

<b>1. INTRODUCTION</b>	<b>4</b>
1.1. Purpose of the guidelines	4
1.2. Application and use of the guidelines	4
1.3. Organisation of the guidelines	4
<b>2. DEFINITION AND SCOPE OF WAITING TIME AUDITS</b>	<b>4</b>
2.1. What is waiting time?	4
2.2. Why are there long waiting times?	5
2.3. What is a waiting time performance audit?	6
2.4. Why carry out performance audit of waiting time?	7
2.5. Waiting time audits and the three Es	7
2.6. Waiting time and the performance audit mandate	8
<b>3. HOW TO CARRY OUT WAITING TIME AUDITS</b>	<b>9</b>
3.1. The performance audit process	9
3.2. Mapping the actors and the workflow using the flow chart	9
3.3. Selecting an audit problem	14
3.4. Determining the audit questions	17
3.5. Measuring the workflow	18
3.6. Analysing the workflow	19
<b>APPENDICES</b>	
1. Four examples of waiting time audits	22
2. Examples of interview questions to auditees	27
3. Examples of interview questions to clients	28
4. Calculating waiting time	29

## 1. INTRODUCTION

### 1.1. Purpose of the guidelines

The main purpose of these guidelines for performance audit of waiting time is to provide guidance when conducting waiting time audits, to bring up to date working methods used and to promote uniform methods. The guidelines describe the conceptual underpinnings of waiting time methodology, explaining in broad terms how these audits should be selected, planned and conducted. The purpose is also to demonstrate how a clearly defined and de-limited audit with clear audit questions will make it possible to carry out a waiting time audit within a short time frame.

### 1.2. Application and use of the guidelines

The guidelines are applicable to all waiting time audits. It is strongly suggested that users refer to the AFROSAI-E Performance Audit Manual for the detailed explanations of key concepts used in performance auditing. The guidelines are written in a way that should also make it possible for inexperienced auditors to benefit from them.

### 1.3. Organisation of the guidelines

Except for chapter 1, the guidelines consist of three parts:

Chapter 2 deals with the definition and context of waiting time audits and defines the characteristics of waiting time audits within performance audit.

Chapter 3 is focused on important steps in the audit process, such as mapping, measurement and analysis.

There are four appendices: Appendix 1 presents four concrete examples of waiting time audits from different sectors and countries. Appendices 2 and 3 list suitable interview questions to auditees and clients respectively. Finally, appendix 4 provides a more technical presentation on how to calculate waiting time.

The guidelines present a number of practical examples. These examples are mostly, but not always, based on real situations and audits. To clarify and highlight difficult issues we have slightly modified the content of some audits.

## 2. DEFINITION AND SCOPE OF WAITING TIME AUDITS

### 2.1 What is waiting time?

*Waiting time* in our context will be defined as *the time clients have to wait for services delivered by a public institution*. Most often we think of clients as external to the organisation (patients at a hospital, applicants at the immigration office, etc.).

Waiting time may deal with the time that clients have to wait for the following:

- To obtain a passport or a driver's licence
- To be admitted to a hospital
- For the police, fire brigade or ambulance to arrive at the spot of an accident
- For the department to respond to a complaint
- For the income declaration to be verified by the tax authorities
- For school books to be distributed
- To have their case processed in court.

From the client's perspective, waiting times are often regarded as long or even too long, time-consuming and unnecessarily costly. A long waiting time is also often a basic factor for client dissatisfaction and to be able to "jump" the queue, they may even serve as the basis for

bribes. Short waiting times, on the other hand, are likely to contribute to fair and stable services and satisfied clients and as such will promote the development of democracy.

## **2.2. Why are there long waiting times?**

Obviously there are a number of reasons for long waiting times. These may be found on the production level, as well as at the top management and governance levels. The performance of the clients may also affect waiting times. Here are some examples of explanatory factors:

- Important bottlenecks in the workflow are not identified as critical to allow for a better flow of activities.
- Conflicting rules, inadequate organisation or incomplete management processes, for example a lack of policies and coordination prevents the organisation from streamlining processes.
- Application forms are difficult to complete, which implies that forms are not complete when handed in.

Furthermore, when many actors or organisations are involved in dealing with the same issue, coordination becomes a separate and crucial factor.

For a more comprehensive coverage of these factors please see chapters 3.2 - 3.4.

### 2.3. What is a waiting time performance audit?

Waiting time performance audits are audits focused on waiting time as the audit problem or possibly the key audit question. The focus is on workflow, i.e. the flow of activities to produce a service, and the existence and explanation of waiting times.

The audits deal mainly with the processing and coordination of all resources and activities necessary to produce a service or some other output. The audits frequently investigate why waiting times vary over time and between regions and local authorities.

#### **Example: A typical waiting time audit – Passports**

To get a passport in the country of Tsibilwe, a citizen has to make an application (input) that is processed by the police, via several internal activities, among others registration controls and printing, resulting in the issuance of a new passport (output).

In Tsibilwe it normally takes six weeks to get a new passport but citizens in two districts complain that they have to wait several months for their passports. Based on these complaints and rumours that the issuing time varies considerably between the police districts, the SAI undertakes a waiting time audit.

The audit starts with a very brief pre-study merely to gain assurance regarding the magnitude of the audit problem and the feasibility of conducting an audit. The main study covers one third of the police districts where data on waiting times is collected from files and through interviews with staff, managers and some clients. The audit confirms significant differences between the police districts when it comes to the time it takes to deliver a passport. In several districts citizens clearly have to wait longer than average for a passport.

The auditors identify three audit questions which are confirmed in the audit:

1. There is no goal stating an acceptable time to wait for the issuance of a passport.
2. All applications are referred to the national registration office. In some districts this is very time consuming while in others the referral is speedier due to better local routines.
3. In some districts only a few civil servants are specialised in the handling of passports. Consequently, these districts are very vulnerable when it comes to sick leave and other absence.

The auditors recommend that the police set standards for waiting time and change the routines for handling of passports, launch a training programme and decentralise the tasks of the national registration office.

The audit is carried out within eight months.

Waiting time audits can be focused on slightly different aspects. They may focus on measuring waiting times or more explicitly address the reasons behind long waiting times. A waiting time approach can be used for all sectors of the economy and can also be applied to many other types of studies such as audits of distribution (of school books, medicine, etc.) or maintenance (of roads, buildings, etc.).

The audit will sometimes cover several organisations and, if so, the auditor must use a broad scope, involving all the actors and organisations involved in the service/production and thus forming the production system.

## 2.4. Why carry out performance audit of waiting time?

There are many reasons for conducting a waiting time audit and they can be formulated in terms of the selection criteria presented in the AFROSAI Performance Audit Manual, chapter 4.2.5.

The *mandate* of a SAI usually allows for identification, analysis and reporting on waiting times.

As waiting time in many developing countries is a big problem for many citizens, waiting time studies can be motivated from a *materiality* point of view.

The *risks* involved are most of all concerned with value-for-money questions such as “Do taxpayers get reasonable value for the taxes paid?” or “Are there any ways to cut costs and improve service delivery and client satisfaction?”

We know from experience that waiting time audits have a considerable potential for *change* and in most cases it is easy for an organisation to shorten its waiting times. Consensus conclusions can quite often be expected on actions to take by the auditees. This is as a result of the fact that waiting time audits are usually concrete, supported by hard audit evidence, and designed within the perspective that significant solutions can be found without additional resources.

Finally, for the auditors waiting time audits are most often *feasible* to carry out. Given their concrete nature they are as suitable for beginners in performance audit as for more experienced auditors.

Waiting time audits can often be completed within a relatively short period of time. A pre-study may take as little as one month and a full report (pre-study and main study) can be completed within much less than a year and sometimes even within half a year.

## 2.5. Waiting times audits and the three Es

The three Es serve as the basis for performance auditors and waiting time audits have clear links to these three concepts. To illustrate this we will take examples from the health sector.

*Economy = Minimising the cost of resources for an activity, having regard to appropriate quality.*

Lack of economic use of resources may increase waiting times for patients. To improve the situation management may have to reallocate resources between different staff and, for example, employ fewer nurses and more doctors. If patients are regarded as a resource, waiting time also has economic implications, i.e. the time taken for patients to wait costs money in terms of lost salaries.

*Efficiency = The relationship between output in terms of goods, services or other results, and the resources used to produce them.*

Waiting time will be determined by matching the efficiency of production, i.e. how many patients the hospital can treat per staff member, to the demand for the services, i.e. number of people wanting to be treated at the hospital. If one hospital department employs 10 doctors and each of them is capable of treating 20 patients per day, 200 patients in total can be treated at the hospital per day, which is a measurement of its efficiency. Even if the efficiency compared to other hospitals in the country is high and has risen during the last years, we cannot tell if this means that waiting times are short or long. If 250 patients come to the hospital each day, waiting times will still be long. Even if efficiency is improved to 23 patients per doctor per day (230 patients per day for the whole hospital) the hospital will still not be

able to reduce waiting times. This will, surprisingly, not happen until its capacity increases to 250 patients a day, e.g. when it surpasses the number of persons queuing for the service.

*Effectiveness = The extent to which objectives are achieved and the relationship between the intended impact and the actual impact of an activity.*

Short waiting times may be included as one of the goals for the auditee and, if so, waiting time audits will directly address the effectiveness issue. Even if this is not the case, long waiting times may influence the effectiveness of an organisation. For a hospital, long waiting times for cancer or heart treatment will probably increase the risk of patients dying. Consequently, if the overall goal is better health for the citizens, long waiting times will certainly reduce the goal fulfilment, i.e. effectiveness within the health sector.

## **2.6. Waiting time and the performance audit mandate**

Stipulating acceptable waiting times is often a political issue. For instance, politicians could set the longest acceptable waiting times or principles for the prioritisation of clients. The purpose could be to facilitate a politically acceptable balance between demand on one side, and resources and competence available on the other. Under such circumstances the political level has taken a clear responsibility for prioritisation and resource allocation.

Quite often there is a lack of clear political policy and priorities concerning waiting times. This is then delegated to management, civil servants or the profession at operational level to formulate the outline, guiding principles and means to reduce waiting times.

The length of a reasonable waiting time depends on the characteristics of the activity. Waiting time for a patient who needs emergency health care should normally be much less than for a patient who wants a vaccination. On the other hand, if there is never any waiting time it indicates that the agency has over-capacity, i.e. not enough work for all employees. The auditors should raise these questions when formulating assessment criteria.

A SAI does not question policy at political level. It follows that the auditor cannot audit the political decisions on waiting times as such. But the auditors could audit the functionality and impact of the political policy adopted for which the political level is ultimately accountable, such as:

- Has action been taken to reduce queues for patients having the longest waiting times?
- Are important bottlenecks identified?
- Are there ways to reduce average waiting times without additional costs?

When analysing the effects of a political policy on waiting times the auditors could to some extent also raise the question of reasonable waiting times and use the results as a basis for formulating assessment criteria. If so, it is advisable to analyse best practice and make comparisons with other similar organisations.

### History of waiting time studies

Waiting time is not a new phenomenon and during history there have been many attempts to cut down on waiting time. We also find different approaches to the waiting time problem, e.g. more hard or soft-oriented approaches.

One pioneer of the “hard-oriented approach” is the American Frederick Taylor, one of the founders of *Scientific Management*. In the beginning of the 20<sup>th</sup> century he started to measure time for specific activities and movements in industrial processes. We find another “hard approach”, although somewhat different in character, within the area of queuing statistics, where clients’ behaviour is simulated.

After the Second World War, the Japanese introduced *Lean production*, a soft-oriented approach used to shorten waiting time and reduce waste in the Japanese car industry. The philosophy has been applied worldwide far beyond car manufacturing. It is called “lean” because the intention is to use “less of everything” compared to traditional mass production. Key factors relevant for public service are, for instance, production focused on customers’ needs and the use of teams of workers with broad and successively deepened competence, and the reduction of all idle time.

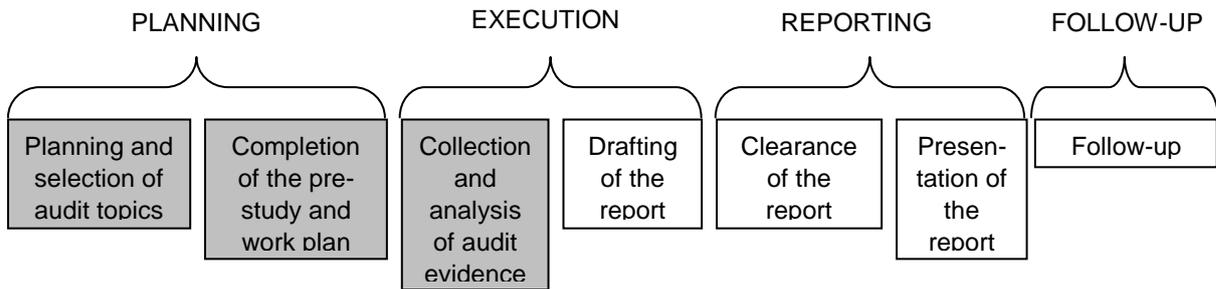
Flow chart analysis was introduced early in the 20<sup>th</sup> century. Nowadays there are a number of other methods to shorten waiting times similar to the useful flow chart analysis. These may deal with performing more activities in parallel, by reprioritisation adding resources to the critical path or helping us to define the most important milestones. Examples are *The Critical Path Method CPM* and *the Program Evaluation and Review Technique (PERT)*. *The Time Based Management (TBM)* approach is a similar technique focusing on the clients’ waiting times with the aim to shorten throughput times.

You could easily find more methods and tools by browsing the Internet.

## 3. HOW TO CARRY OUT WAITING TIME AUDITS

### 3.1 The performance audit process

The performance audit process covers several steps. It comprises planning, execution (conducting the main study), reporting and follow-up. Each one of these processes can, according to the AFROSAI-E Performance Audit Manual chapter 2.3, be divided into different stages. This is demonstrated in the diagram.

**Diagram 1: The performance audit process**

These guidelines are focused on those planning and execution steps where you need specific techniques and methods unique to waiting time audits. For the other steps we refer to the AFROSAI-E Performance Audit Manual. More precisely the attention in this chapter is on specific issues within the planning and execution phases:

*Planning - Selection of audit problem and audit questions*

The discussion is focused on three activities within the pre-study:

- Mapping the actors and flow of activities to describe the process (see chapter 3.2)
- Selecting an audit problem (chapter 3.3.)
- Defining audit questions (chapter 3.4.)

*Execution - Collection and analysis of audit evidence*

The discussion is focused on two activities in the main study:

- Measuring the time needed to carry out the work flow (chapter 3.5.)
- Analysing the audit evidence linked to the flow chart (chapter 3.6.)

### 3.2. Mapping the actors and the workflow using the flow chart

It is always helpful to describe the audit object. The description will facilitate the collection of audit evidence and the findings can later be linked to different actors within the system.

During the pre-study, or the beginning of the main study, auditors should make a flow chart<sup>2</sup> of the selected processes. A flow chart is a graphic representation of a process, depicting inputs, outputs and units of activity. It represents the entire process, allowing analysis of waiting times, workflow and service delivery. The purpose is to identify and describe all activities necessary to produce the service and all internal and external actors involved. By using the flow chart the actors are charted at the same time as the workflow.

Flow-charting can be done in several ways depending on the purpose of the charting. Diagram 2 illustrates a flow chart for an applicant to receive a business licence. It focuses the actors involved, their actions and decisions. It also clarifies the responsibilities of actors at different levels. Diagram 3 illustrates a flow chart for purchases using a slightly different way of notification. As you can see, different symbols can be used, for instance, for decisions by managers and officers or to clarify the difference between actions and decisions. There is no universal standard for the symbols used. The flow charts can also be used to analyse the process before and after restructuring has taken place.

Examples of useful tools can easily be found on the Internet if you search for flow charts.

<sup>2</sup> In text books you will find concepts, for example process mapping, similar to flow-charting.

The workflow may be simple, as in the diagram, just showing major activities, or complex where many more activities are involved.

It is often interesting to classify the time taken according to different types, such as:

Administrative time understood as active time handling the application or similar activity, such as to compile information, evaluate the circumstances and make a decision, and file the case, etc.

Idle time is understood as (internal) waiting time within the service delivering organisation. In this case officers or experts within the performing organisation wait for tasks to be carried out, queuing for an activity to start, etc. With regard to idle time, we can also refer to the situation where an office has to carry out a number of other prioritised activities unrelated to the service/product analysed.

Referral time means waiting for supporting organisations to perform the tasks for which they are responsible. This implies referring to other units, departments, committees or sometimes stakeholders or even applicants for comments. Referral time consists of both active administrative time and idle waiting time within the supporting organisations.

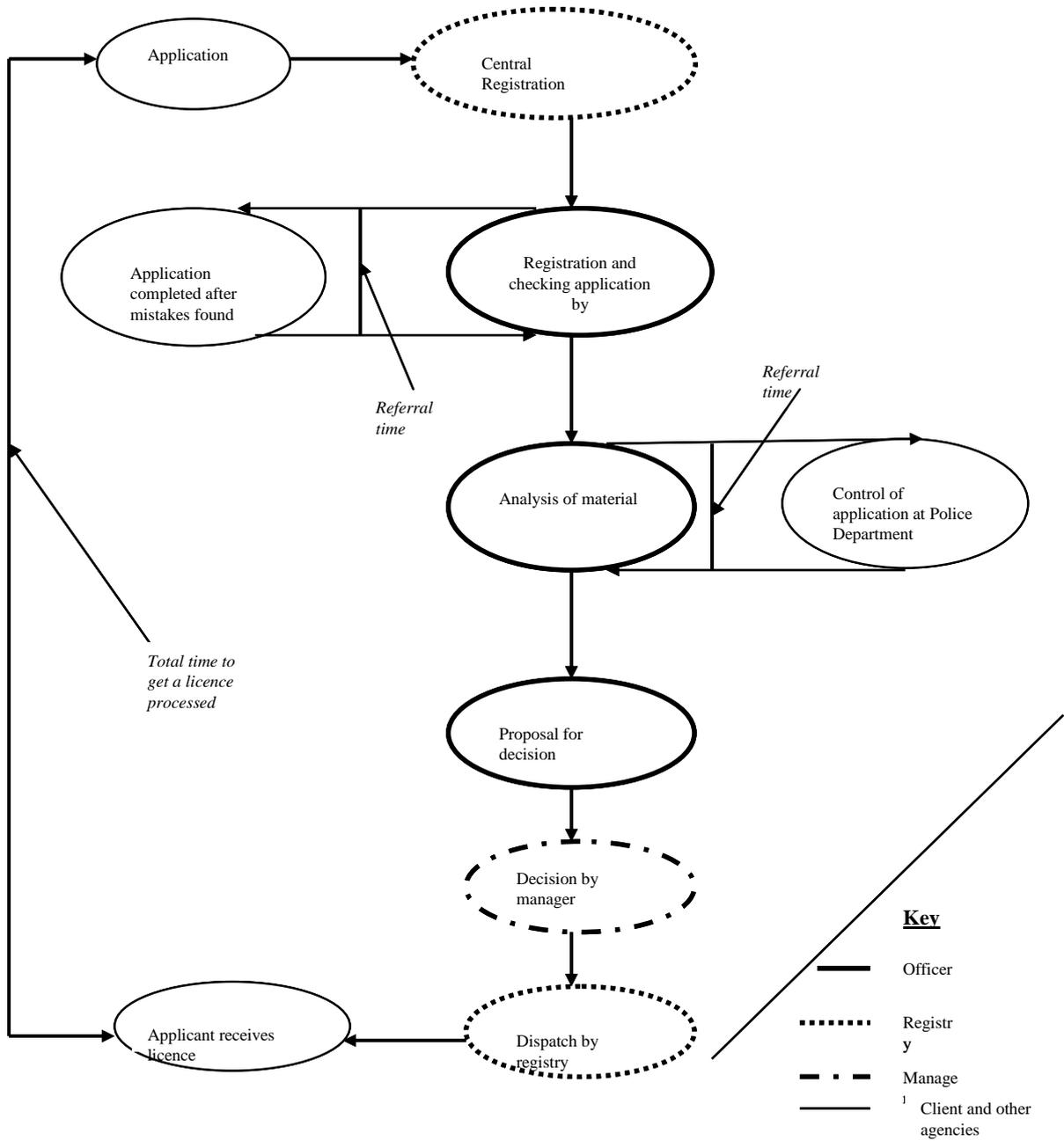
Our definition of waiting time is based on the client's perspective<sup>3</sup>. To clarify the character of waiting time, let us consider the person applying for a passport. If she has to wait six weeks for a new passport, these six weeks are considered as waiting time from her perspective. This manner of thinking is independent of whether the six week is merely hard administrative work or whether it is idle waiting within some departments of the public sector.

It is often of interest to carry out a flow chart analysis for different outputs or clients. At a hospital there may be easy but also more difficult cases and at the immigration office we may have persons from neighbouring or remote countries. It may also be interesting to compare the flow for persons of different ages, sex, economic status, etc. Normally in a workflow, idle time is by far the most time-consuming part and the easiest to reduce. Consequently, the audit is often concentrated on long idle times in the workflow.

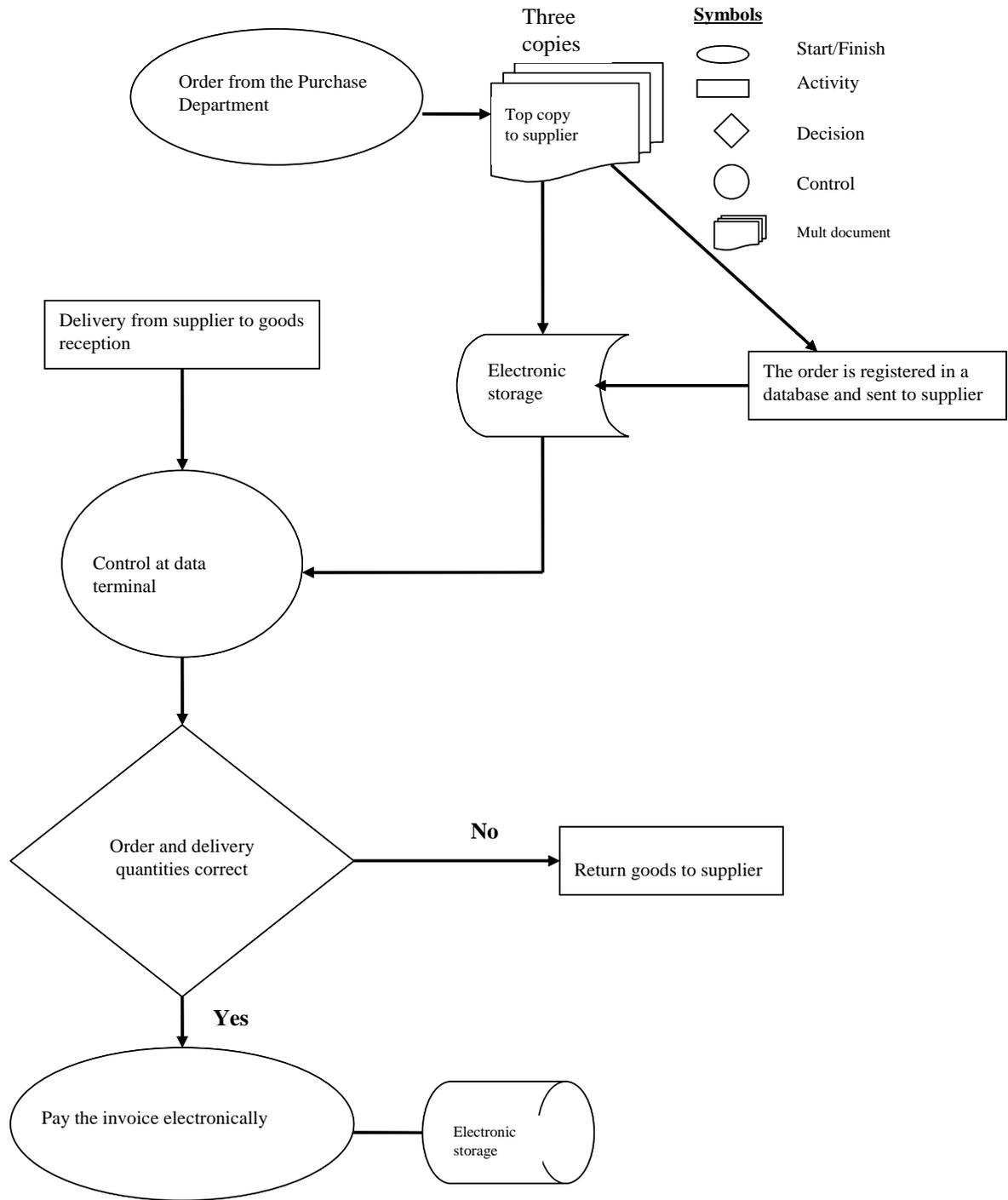
---

<sup>3</sup> In the literature on flow-charting, waiting time is sometimes used as a definition only of staff's idle waiting to take action. In these guidelines we call that idle time.

Diagram 2: Flow chart for Business Licenses



**Diagram 3: Flow chart for Purchasing**



Most often it is easy to draw the flow chart and in the table below we give you some advice on how to do it.

### How to produce a flow chart

1. Define the start and finish of the process. At a hospital the process may start with the registration and finish when paying the bill or getting medicine.
2. Document all important steps in the workflow in chronological order. It is often helpful to get going from the client's perspective and follow the client through the system.
3. Link each step to the responsible person(s).
4. Consider an alternative design of the flow chart (see our two diagrams).
5. Use any of the drawing software such as Microsoft Word ("insert picture") or PowerPoint (organisational layout).
6. While you chart the workflow, you often get ideas on how to improve the flow. Remember to document them.

To produce the workflow the auditor uses written documents as well as interviews with staff, management and other involved actors. When interviewing people the auditor may at the same time gather data on the flow, measurements of the time to carry out separate activities and performance of actors involved in the process. It is a very good idea to show the flow chart to the interviewee and ask her/him to comment.

During a pre-study, flow-charting is used to identify the workflow. It should make it possible to get a fair description in the work plan of the steps in the process, the actions and decisions taken, the actors involved and how they cooperate. Already at this phase it will often be easy, just by scrutinising the flow chart, to identify bottlenecks, time-consuming activities, officers who are not needed for the handling of the service, etc. In this respect statistics from the audited organisation(s) may also be an add-on, for instance the number of patients or issues waiting in different steps of the process or other efficiency or performance information.

The auditor may encounter situations where there is one official workflow, which may even have been documented. At the same time, work may be carried out in a completely different way. This discrepancy between the official and the unofficial workflow will be a good basis for the audit work.

### 3.3. Selecting an audit problem

As described in chapter 2.4, selecting an audit problem involved the following:

#### **Mandate**

- Does the problem fall within the mandate of the SAI?

#### **Materiality**

- To what extent does the problem affect the citizens, the economy and government finance?

#### **Risk**

- Is there a risk that money may be lost or used wastefully?

#### **Auditability**

- Are relevant and accepted auditing methods applicable and are sufficient resources available?

### Potential for change

- What are the possibilities that conclusions and recommendations of the audit will be accepted?

When selecting the audit problem the preconditions may vary and fall into two categories, namely the basic and the complex situation. The ways to approach the audit problem will vary accordingly.

#### *Basic situation*

The basic situation occurs when auditors are already focused on waiting time as the possible audit problem. Auditors will probably know that the waiting time study falls within the SAI's mandate. If waiting time is on the public agenda they will also know that materiality and risk are involved. As already mentioned in chapter 2.4, waiting times are also most often easy to change and reduce. Consequently, to have a basis for the decision whether or not to proceed with a main study, there are two important things for the auditor to check in the pre-study. The first is auditability, i.e. that it is possible to carry out the audit, and the second is to get confirmation on materiality and risk. Consequently, a pre-study on waiting time can be very short and mostly focused on the work plan for the main study. It may therefore take less than one month to complete. Also, the main study can be shortened and consequently a performance audit on waiting time can be completed within much less than a year, sometimes even within half a year.

In this basic situation it will be appropriate, and sufficient, to use *only* a flow chart as a basis for the pre-study.

#### *Complex situation*

The situation may be more complex and the reasons for long waiting times composite. Waiting time may also be only one of a number of problems which auditors may consider focusing their pre-study on. In this case a flow chart is not enough as a basis for the pre-study and it would be necessary to use a problem-tree analysis.

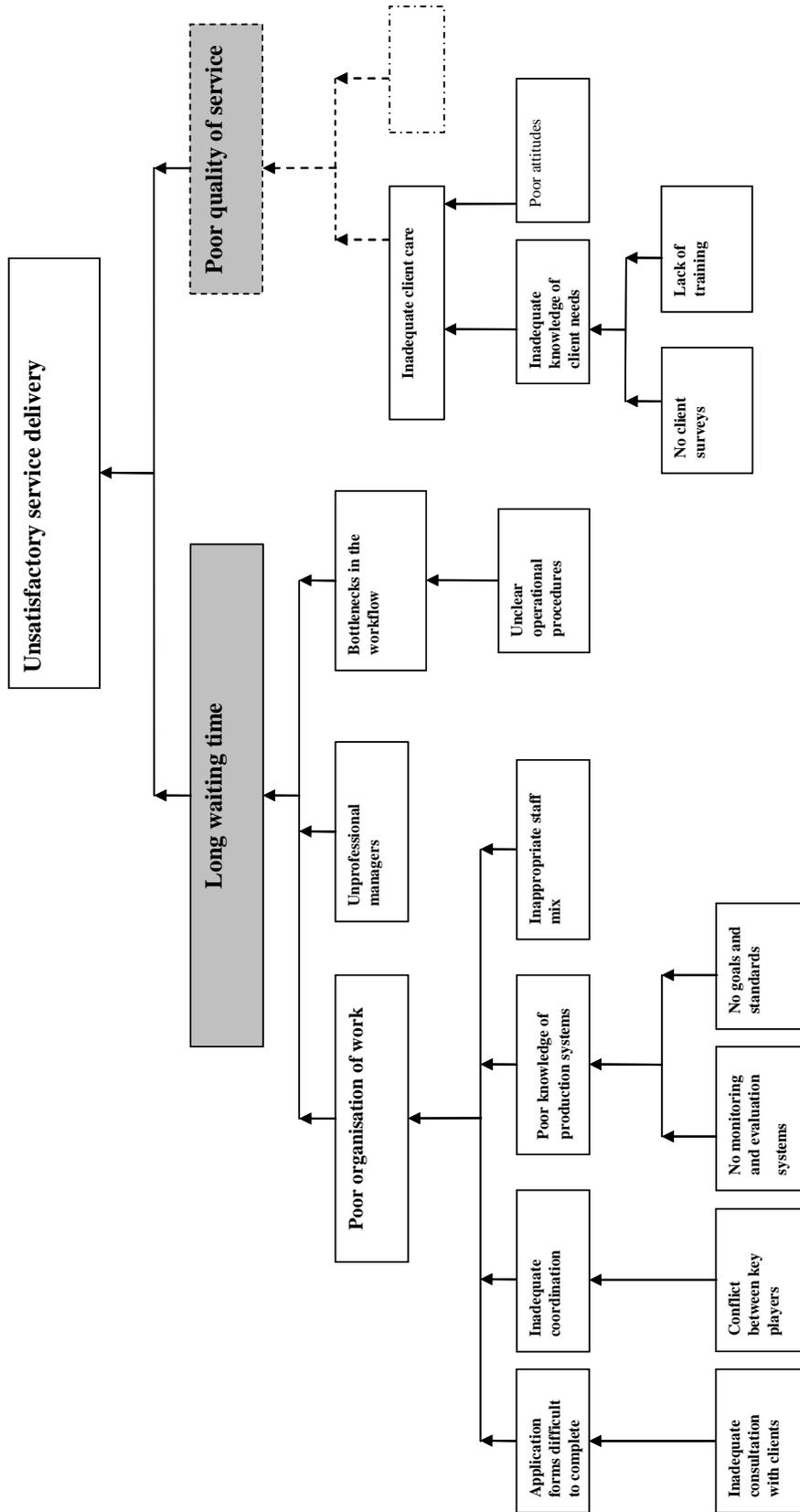
In the AFROSAI-E Performance Audit Manual, chapter 4.2.4, there is a presentation of the problem-tree analysis technique. It relates and links different problems to each other hierarchically according to how they influence each other. The main purpose is to identify possible audit problems from the observations and findings made during the pre-study. Any box in the tree can be identified as a problem. Causes of that problem will then be found as you move downwards in the tree and the consequences as you move upwards.

In diagram 4 we present an example of a *typical problem-tree* for long waiting times. It will probably fit into most situations of waiting time audited by SAIs. However, each SAI should consider the national conditions and discuss whether this problem-tree also represents the situation it is going to audit. The typical problem tree will make it easier for the auditor to:

- Work out a *specific* waiting-time problem tree for the organisation(s) audited

A pre-study addressing waiting time as one of a number of problems may end up not focusing on waiting time as such but on explanations of this phenomenon. The reason for this refers to the selection criteria above. Related problems may look more relevant when it comes to materiality and risk or it may be too difficult to measure waiting time (auditability). Finally, the magnitude of the waiting time may already be well known but not the reasons behind it.

Diagram 4: Typical problem-tree for long waiting time



### 3.4. Determining the audit questions

When formulating audit questions the auditor is advised to ensure that each issue to be raised in the audit is handled separately and, where issues are linked, there should be a clear indication of how they are linked. As for how many audit questions should be formulated, this will depend on the scope of the audit problem defined. However, it is suggested that the audit questions be limited to five.

#### *Basic situation using the flow chart approach*

In this case, with possibly no specific problem tree defined, we may use the flow chart and, if needed, the typical problem tree given in chapter 3.3 for defining audit questions.

The auditor may formulate the general audit question as follows:

1. Is there poor organisation of work?

The flow chart is tailor-made to handle this audit question. By using the flow chart and interviewing the people involved the auditors will identify the explanatory factors<sup>4</sup>. This open approach is challenging but will also create good opportunities to receive relevant explanations. As it is also a bit risky, it is preferable that experienced auditors choose this approach.

If the auditor makes use of the typical problem tree from diagram 4 of chapter 3.3, the audit question relating to poor organisation of work will be found at the level just below “Long waiting time”.

You may also use some of the problems at lower levels as audit questions. In this case you may prioritise and the additional audit questions may be the following:

2. Are there bottlenecks in the workflow causing queues and idle time?
3. Is the long waiting time explained by non-professional management?
4. Are the application forms too complicated, causing troubles for the clients?
5. Is the mix of resources, especially the mix of personnel, optimal?

More detailed questions concerning, for instance, audit question 2 on bottlenecks in the workflow, could then, depending on the observations in the pre-study, be as follows:

- 2.1. Are there differences in idle times between regions or local offices, between different seasons or years?
- 2.2. Could long idle times be observed in any step of the flow, critical in the sense that they have to be reduced to shorten clients’ waiting time?

The flow chart as our operative model makes it possible to measure delays, find explanations for the bottlenecks in terms of the audit questions and present our findings, conclusions and recommendations according to the various steps and actors in the model. This means that we can choose the flow chart analysis as our main tool for planning, collecting and analysing data.

#### *Complex situation using the problem-tree approach*

If auditors develop a problem tree specifically for the analysed waiting time problem, they will be able to define audit questions just below the selected audit problem. These will probably be

---

<sup>4</sup> For comments on the more open approach also see the *Swedish Handbook on Performance Audit*, second edition of 1999, page 69.

similar to those of the problem tree in diagram 4 above, but should always be adapted to the specific circumstances.

### *Summary*

As the reader will notice, the situation the auditor faces (basic or complex situation) will determine the tools he/she will use to resolve the audit questions.

### **3.5. Measuring the workflow**

In section 3.2 we discussed how flow-charting could be used to identify waiting problems and to point out important and time-consuming steps in the flow that may need closer examination.

In the main study, it is likely that measuring of real time consumption may be considered necessary<sup>5</sup>. The flow chart from the pre-study is then used to identify the most important steps to measure, i.e. with indications of long idle times. It is also used for the definition of the start and end of the process measured. For instance, the main study may measure all steps and the time needed from registration of a patient in a hospital until the time she is admitted to a specialised clinic. It will give the auditors concrete evidence as a basis for further analysis, elaboration of the problem tree and findings and conclusions on waiting times.

Some typical steps to take when measuring are the following:

- Identify the start and finish of the workflow audited
- Measure the total time clients have to wait
- Identify functions with long idle times and measure time for these functions
- Consider measuring time for regions, specific clients, different types of services, etc.
- Consider measuring administrative, idle and referral time.

As mentioned in appendix 4, it may be tricky to get a perfect measurement of the waiting times and most often approximate figures must be used.

The auditor may want to get a broad picture of waiting times but may also want to give more details. Consequently, a combination of a survey with readily available statistics and some case studies where the auditors are able to dig deeper into the material, is advised (for surveys and case studies, see AFROSAI-E Performance Audit Manual, chapter 5.4).

The following are common methods for auditors to use for measuring waiting time:

- *Compile* data from existing statistics (documentary evidence)
- *Observe* waiting times yourself (physical evidence)
- *Ask* staff or clients to estimate waiting times (testimonial evidence)

#### *Compiling data from existing statistics and databases*

If the auditor is lucky there is already data available on waiting times, either on paper or on software such as databases. In most cases, however, the auditor must spend time compiling and aggregating the data. It is important for the auditor to assess how much work compilation of relevant data requires.

If no data is available the auditor may be able to convince the auditee to record data on future operations. However, this implies that no historical comparisons can be made.

---

<sup>5</sup> You will find more information on the technical aspects of measuring waiting time in appendix 4.

### *Observing waiting times yourself*

The auditors may choose to observe waiting times themselves. This may be done by, for example, sitting in the waiting room of a hospital. An advantage with this method is that it allows the auditor to be active and to control the situation. However, there are also many disadvantages. The auditor will not be able to retrieve historical data and the method is generally very time consuming.

### *Asking staff or clients to measure or estimate waiting times*

Even if no data is available and if it is not possible to make own observations, the auditors may use a third method for measuring waiting time, namely to ask staff, management and other involved actors about the waiting times. However, interviewees may not remember and may have difficulty in understanding the concept. Moreover, managers may tend to underestimate the waiting times and clients may overestimate them. This means that the reliability of such is not so high. Consequently, if this method is chosen it should always address different stakeholders to make it possible to corroborate and compare their testimonial evidence.

### *Competent evidence*

Experience shows that when using the flow chart analysis the auditor will receive a great number of explanations for the waiting times. Consequently it is important for the auditor to be open to all types of explanations but at the same time put much energy into assessing the audit evidence collected.

According to the AFROSAI-E Performance Audit Manual, chapter 5.6.1, the auditor should look for competent evidence: reliable, valid and sufficient and also collected at a reasonable cost. In general terms it is impossible to assess the three different methods mentioned above as the competence will vary from case to case.

## **3.6. Analysing the workflow**

In the main study, the analysis of the workflow will be based on the flow chart and possibly the problem tree, the derived audit questions and the assessment criteria. The auditor will combine the hard facts derived from measuring with the soft data from the interviews. The chart will help you when analysing and you may also structure your findings according to the different actors and activities in the flow chart.

The following is a compilation of findings and conclusions from more than 10 waiting time audits examined within AFROSAI-E or by the Swedish National Audit Office. To a considerable extent they have observed more or less the same type of problems as mentioned in the typical problem tree we presented in diagram 4. Most of these audits have also found related and contributing problems on efficiency, management and information systems. Our review of these audits is the basis for the following categorisation of typical findings:

### **1. Idle times are crucial for client's waiting times**

A very common result is that only a small portion of the total waiting time is used for the executing officers' handling of the process. Instead, the idle time occupies the major portion of the total throughput time. This is true for the handling of an issue in the organisation responsible, as well as referrals to supporting organisations. **Thus it is by far the most effective way** to reduce the waiting times for the clients.

## 2. Lack of policies and management control

A rather frequent observation is a lack of communication between the headquarters and the regional and local branches, which tends to increase waiting time. Another is an unsatisfactory follow-up system or a limited number of inspections. There could be several consequences. For instance, considerable undesired differences between regional and local bodies could arise if the focus is not clearly stipulated by top management.

If the allocation of resources is not flexible enough and adapted to reality it could prolong waiting times. Finally, an unsatisfactory order of priority for cases could lead to longer waiting times as well as lower productivity and poorer service to the clients.

## 3. Ineffective coordination of shared responsibilities

Quite often a time-consuming and extensive referral to responsible parties can be explained by complicated legislation or by a department's internal regulations. The responsibility of ownership is shared among many. If so, there is often a queue to each authority or unit involved. On one hand this could sometimes be an important prerequisite for the equality of rights or the efficiency of operations. On the other hand, this could at times hinder administrative improvements. For instance, it could delay the workflow and a desirable adaptation to regional and local circumstances.

## 4. Incomplete applications

A considerable number of the applications are not comprehensive enough and have to be redone. The application process could be severely delayed and more or less has to start again from the beginning. Bad quality of input is then an explanation for long idle times and ultimately for long waiting times for the client. The incomplete applications may be the result of an easy-going attitude, carelessness or withholding of relevant information on the client side, or too complicated rules and/or forms on the public administration side. Simplified rules, readable forms and precise and accurate input of information from the client could be important means to shorten waiting times.

## 5. Waiting time audits reveal many related effectiveness problems

Nearly all our examinations clearly illustrate that in addition to reduced waiting times, such audits also reach conclusions and make recommendations on matters of reorganisation, raised efficiency and service, often closely related to the long waiting times. Evidently the auditors also find other important efficiency problems to address while searching for explanations to long waiting times.

## **Recommendations**

The recommendations in the presented reports were clearly linked to the findings and conclusions. Examples of recommendations made are the following:

- Shorten the waiting times to improve the quality of actions and decisions
- Develop clear goals and ensure supervision and organisation of work
- Establish an information desk to assist the clients
- Upgrade the administrative system for the time taken by clients
- Address the mix of personnel, such as nurse/patient ratio
- Select applications according to estimated complexity
- Experiment with a project organisation handling a limited number of special issues
- Introduce a computerised follow-up system at central level to reveal bottlenecks
- Implement a training programme in customer care.

**Using the flow chart**

*I enjoy so much using the flow chart and I find it a very effective tool for performance auditors. Immediately when I start an audit on waiting time I try to draw up the flow chart by interviewing people. So the chart is built up piece by piece. After I have established the chart I draw it nicely on a big piece of paper. During my interviews I put it right in front of the interviewee and ask her/him to comment on the different activities and actors. They all start talking about inefficiencies and bottlenecks by themselves so I usually don't even need to pick up my interview guide. I collect so much information by working like this. In fact, sometimes I can also do the analysis of my audit evidence together with the interviewees while using the chart.*

Performance Auditor

## Appendix 1: Four examples of waiting time audits in brief

A categorisation of typical findings made in some waiting time audits was found in chapter 3.6. In the following items we will provide a brief overview of audit problems, audit questions, findings and recommendations from some finalised audits. The presentation is simplified, concentrated and covers only some parts of the audit reports.

### Example 1: Waiting time at a hospital<sup>6</sup>

#### Audit problem and design:

This general survey examined the internal processes of a hospital, which in some cases created long queues resulting in patients waiting too long to be attended to. The survey focused on the internal processes and systems in place regarding registration, queues for registering, receiving medicine at the pharmacy, X-rays and laboratory attention.

#### Audit questions:

Three basic audit questions were asked:

- In which specialised departments are there long queues?
- What are the causes of long queues?
- Are there any other problems associated with long queues?

#### Findings and conclusions:

The main findings and conclusions were:

- One main reason for the long queues was that patients do not go to clinics in their respective areas. Instead they prefer to go to the central hospital.
- Contrary to the rules, patients use the hospital as both a referral and a district hospital. This created overcrowding and increased the workload of the hospital.
- The audit revealed weaknesses emanating from waiting time of patients, occupancy rate of the wards, maintenance of equipment and non-availability of drugs, inadequate specialised manpower and non-availability of facilities.

#### Recommendations:

The SAI came up with the following recommendations:

- An information desk should be established to assist the patients in easily locating their destinations.
- Facilities and equipment should be serviced regularly and maintenance schedules should be developed.
- The reorder level for drugs should be revised.
- To determine the time patients spend at the hospital the administrative system should be upgraded.
- The capacity of specialists in specialised clinics should be strengthened.
- Recruitment procedures should be revised to ensure that vacancies were filled properly.
- The nurse/patient ratio should be addressed.

#### Lessons learnt:

This example gives us an illustration of how a study with comparatively small resources and a limited time frame can produce a good understanding of the relevant problems, draw conclusions and provide some constructive recommendations. Quite a lot can be achieved in a rather straightforward and down-to-earth type of audit. Some ways were found to reduce waiting times, but other important problems were also identified at the hospital which had other explanations that had to be addressed.

---

<sup>6</sup> General survey on Waiting Time at Princess Marina Hospital, OAG Botswana, 2005.

We can see that a waiting time study must not necessarily only find ways to reduce waiting times as the only important conclusion. This example demonstrates that the auditor has to be prepared to change his or her assumptions regarding problems and their explanations. Models and maps quite often have to be modified since our questions and checklists do not fully cover the actual situation and its problems.

### **Example 2: Driver's licences and transport permits<sup>7</sup>**

#### Audit problem and design:

During a pre-study, the auditors discovered that there were delays in the issuance of licences and permits. It took a long time for people to acquire licences and permits and this was due to backlogs.

For a period of two financial years the review covered the headquarters and 12 out of 22 offices dispersed around the country. In most cases the filing system was not up to date and some data was missing. Apart from document review, the information collection was based on interviews and on observations at some outstations to ascertain time taken at various stages in the process.

#### Audit questions:

The basic audit question was:

- In what way is the issuance of licences and permits managed by the responsible department and are there opportunities for improvement?

#### Findings and conclusions:

The main findings and conclusions were as follows:

- One act did not specify what part the officer in charge should play in the issuance of licences and another did not make a clear distinction between long- and short-term permits.
- There was a lack of proper standards, guidelines and procedures within the department.
- No proper supervisory and monitoring mechanism. For several years there had not been an inspection tour by headquarters.
- There was an inadequate level of interaction between management and staff.
- Examiners did not possess all the required licences, yet they tested candidates.
- Board meetings were not held on a quarterly basis as required.
- Invitation letters to applicants took 30 days instead of the mandatory 21 days.

#### Recommendations:

The main recommendations were as follows:

- An effective supervisory and monitoring mechanism should be put in place to coordinate activities.
- Regular communication should take place between headquarters and the outstations to ensure that relevant issues are understood and follow-up takes place.
- The department should prescribe a reasonable time frame for processing of applications from date of receipt to date of approval.
- A training plan should be in place to ensure that officers are in possession of the required licences to test candidates.
- Board meetings should be held according to stipulated time frames.

---

<sup>7</sup> Management and Issuance of Licences and Transport Permits by the Department of Road Transport and Safety, OAG Botswana, 2005.

Lessons learnt:

Even if policy decisions at political level is not audited by the SAI an audit could shed light on the administrative consequences of unclear regulations. In a situation with inaccurate or incomplete data in the management information system an audit could still be conducted based on interviews, questionnaires and observations. In this audit, hard audit evidence could to a considerable extent be based on observations.

**Example 3: Registration of Deeds and Companies<sup>8</sup>**Audit problem and audit design

The main audit problem was the low efficiency of service delivery in the Office of the Registrar of Deeds and Companies Registrars' Office and ineffectiveness in the execution of its mandate.

The auditors examined service delivery focusing on institutional customers and individual companies as the major stakeholders. The main focus was on counter service to evaluate customer care, examination of documents to assess timeliness in document processing, and review of operational internal controls. The audit team visited two offices and interviewed 32 customers and 10 companies. In total 250 questionnaires were sent out to evaluate customer care.

Audit questions

Three main audit questions were asked:

- What is the impact of inadequate customer care on service delivery?
- How are delays in processing deeds and company documents affecting the quality of services to the clients?
- To what extent is the lack of supervision, training and effective communication affecting the efficient processing of documents?

Findings and conclusions

The main findings and conclusions were as follows:

- Inadequate customer care caused the stakeholders of the department to be dissatisfied. The auditors found that office orderlies were not trained in customer care, manning the counters and prisoners, filing and retrieving documents. In Harare it took customers an average of 2 hours 20 minutes while in Bulawayo it took an average of 12 minutes to complete a transaction. The inadequate customer care was due to lack of supervision and organisation, lack of training, ineffective communication and a non-conducive working environment.
- There were delays in processing documents. Even though the registrar undertook to register all company documents and deeds within three days, the auditors found that it could take as long as two weeks for documents to be processed.

Recommendations

The main recommendations were as follows:

- The department should implement a training programme in customer care and implement a business-like culture of valuing all its stakeholders as it discharges its duties and mandate. For this to be possible management should have clear and well-communicated goals and strategic plans and ensure supervision and organisation of work at all times.
- The computerisation programme should be well planned in order to improve the operations of the department.

---

<sup>8</sup> Service Delivery by the Department of Deeds, Companies and Intellectual Properties, Zimbabwe Audit Office, 2004.

### Lessons learnt

From this example we can learn that for service delivery to be effective organisations should address the needs of the clients as a priority. As auditors it is critical to note that waiting time audits do not only address problems relating to the process but also problems relating to structural and management issues.

### **Example 4: The asylum process<sup>9</sup>**

#### Audit problem and design

This audit focused on the first stage of the asylum process, which was considered of great importance in order to deal swiftly with issues. The objective of the audit was to determine whether items were flowing smoothly and whether the handling of issues was of a high quality. The aim of the audit was reduced throughput times, reduced costs and higher quality in processes and decisions for maintaining the rule of law.

The quality concept used was divided into the quality of the process and service to the clients, on the one hand, and the quality of the product (the output) on the other. By way of a flow chart the auditors mapped the different steps in the process and the bodies and units involved. A measurement of some time-consuming steps in the flow of items followed, which was based on a random selection of issues from different regions. Based on measurements and estimations the time used for each step in the process was examined as well as quality aspects in the handling of issues. In addition, interviews were conducted and an analysis was performed of the quality of basic data for decision-making. Seminars were held with focus groups to discuss observations and the possibility of making alterations.

#### Audit questions and assessment criteria

The basic audit questions asked were:

- Which are the obstacles hindering an effective asylum process that is smooth, speedy and in accordance with the legal rights of the individual?
- Are there regional differences in waiting time within the public sector due to variations in the quality of the internal processes or variations in production methods?

#### Findings and conclusions

The main findings and conclusions were as follows:

- The influx of applicants varied greatly over the years mainly due to circumstances in other countries. The preparedness and flexibility of the ministry and public sector bodies had to be high.
- The initial steps in the asylum process were of outmost importance for the speedy handling of asylum issues in accordance with the Immigration Law and the Rule of Law. One reason was that many asylum applicants had no passports or other documentation to prove their identity, and prerequisites for applying for asylum were not known. The difficulties in establishing the identity of the foreigners and the purpose of their visit to the country led to an overload of evidently unjustified applicants in the asylum process.
- A very high percentage of the applications were denied, meaning that a considerable part of the resources for the asylum process was used for prohibited persons.
- Experience from one of the regional bodies audited strongly indicated that it was possible to deal partly with the problem of unjustified applicants by an early more careful examination and classification of simple and complicated applications. The deportation of persons with obviously unjustified applications, contrary to the law, could then be carried out earlier, without any loss of legal rights for the individuals involved.

---

<sup>9</sup> Hanteringen av Asylärenden (Processing of applications for asylum), NAO Sweden, 1994.

### Recommendations

The auditors outlined an alternative solution that could be considered, especially in reducing the long waiting times. Among other things, the SAI recommended the following:

- Measures taken to shorten the idle times and improve the quality of actions and decisions
- A more careful examination of entry conditions and identification documentation on arrival in the country
- A careful selection of issues according to estimated complexity
- Experiments with project organisation, handling a limited number of issues with individuals from a few countries
- A follow-up system at central level to reveal bottlenecks and, if needed, to facilitate active reallocation of resources.

### Lessons learnt

From this example we can learn that the flow chart technique facilitates the mapping of the steps taken and the participants involved in a process. Based on the information in the chart, measurements of idle time and waiting times can be carried through, giving the auditors concrete audit evidence. Interviews can help the auditors to distinguish between external reasons for long waiting times beyond the auditee's control and internal factors due to the process in the public sector body. Best practice can be developed by observing and analysing the outcome and effects of local or regional experiments and solutions. Effectiveness in this case can be improved if the first-in first-out policy is replaced with a policy based on a thorough selection of issues.

## Appendix 2: Examples of interview questions to auditees<sup>10</sup>

### Mapping

1. Concerning the production of X, how is your production process organised?
2. Which other actors are involved and what are their roles in the production process?
3. Are there any other public organisations involved in this production?
4. Is there a written document showing the production process? Has it been updated?
5. Has the process changed during the last years? Why? Any documented results?
6. Often you find that the official production process as documented does not correspond to the actual process. What is the situation at your place? If there is a discrepancy between the official and the unofficial process, how can you explain it?
7. Are there any goals or written management directives for this production?
8. Are there any evaluation reports on this production? Any ongoing investigations?
9. Have you conducted any client surveys recently? What were the results? How would you describe your knowledge of the clients' needs?

### Measuring

10. Which are the most time-consuming activities within this process?
11. Do you have data on time spent on various activities within the process?
12. Do you have data on the waiting time for your clients (for different products/clients)?
13. Has the waiting time for your service changed over time? How?
14. Does waiting time differ between your respective branch offices?
15. Is it possible for you to divide the time you spent on activity X (see flow chart) into administrative time, idle waiting and referral time (only for specialists in measuring)?
16. Do you have any statistics or follow up on:
  - a) The number of incomplete applications returned to the applicant
  - b) The referral time when other organisations contribute to your production
  - c) The magnitude of client complaints and how you take care of them

### Analysing

17. What do you regard as explanations for the waiting times?
18. Where do you find the bottlenecks in the process?
19. How do you assess the performance of different activities to produce your service (show the flow chart)?
20. How would you comment on the performance of the different units, staff and managers involved in this process (show the flow chart)?
21. How would you comment on your own role, task and performance?
22. We have preliminarily identified X explanatory factors for the waiting times (use your audit questions). To what extent do you believe they can explain the waiting times?
23. Are there other factors that explain the waiting times?
24. What recommendations would you like to make in order to decrease the waiting time?

### Any other business

25. Do you have any other comments on the performance of your office?

---

<sup>10</sup> The questions may be put at the same time or on different occasions.

### Appendix 3: Examples of interview questions to clients

#### Mapping

1. Which staff and managers have you met when applying for this type of service?
2. Very often you find that the official production process as documented does not correspond to the actual, unofficial process. Have you any idea of the situation at this office (observe that not all clients know the official process)?

#### Measuring

3. How long has it taken you to get this application (or similar) approved?
4. How long did it take to get the application form?
5. Was the form clear and easy to understand?
6. Was the form checked for completeness at the time when you handed it in?
7. Do you believe this waiting time is average for the office or was your application handled faster or slower than average?
8. Has the waiting time for this service changed over time? How?
9. Do you know if waiting time differs between the respective branch offices?
10. How do you generally assess the quality of the service provided by this office?
11. How do you generally assess the performance of staff members/managers who you have met?

#### Analysing

12. What do you generally regard as explanations for the waiting times?
13. Where do you think there are bottlenecks in the process?
14. We have preliminarily identified X explanatory factors for the long waiting times (use your audit questions). To what extent do you believe they can explain the waiting times?
15. Are there other factors that explain the waiting time?
16. What recommendations would you like to make in order to decrease the waiting time at this office?

#### Any other business

17. Do you have any other comments on the performance of this office?

## Appendix 4: Calculating waiting time

In this appendix we will demonstrate basic calculations on waiting times and related concepts.

### 4.1. Procedures for calculation

In chapter 2.1 waiting time was defined as *the time clients have to wait*. When we measure waiting time we have to be more precise and consider the following issues:

1. Which *services* should you focus on? In some cases this is evident and, for example, a passport is a fairly standardised product. However, at a hospital there are many services and queuing systems.
2. For which types of *clients* should you measure waiting time? At the hospital we may make a distinction between men and women, young and old or even rich and poor patients.
3. On which *process* in the service delivery should you focus? This type of calculation can be made for the whole production process or for specific time-consuming or troublesome processes.
4. How is the *data* going to be collected (asking clients, analysing files, etc. -see chapter 3.5.)?
5. Which *statistical measurements* should you use and which comparisons should you make? Examples of possible measurements are shown in the table<sup>11</sup>.

#### Examples of measurements of waiting time:

Averages	Variation	Comparisons
Mean	Range (maximum - minimum waiting time)	Average for a number of years or months (trend)
Median		Average for different branches or districts
		Average for different types of clients

One way of calculating waiting time is to trace all clients who, for example, are applying for a passport and are in line on 1 January, to assess how long it takes for them to get the passport. This may be quite time consuming for the auditor. Another way of measuring would be to find out from all clients who received their passports in a certain week, how long it had taken to get the passport. The results may vary between these two ways of measuring.

### 4.2. The method of prioritising affects waiting time

Applications can be sorted in different ways. The total amount of work needed to handle applications usually, as in our case below, does not depend on the sorting methods. However, a classification of applications can sometimes reduce the number of clients waiting for a decision as well as the total costs.<sup>12</sup> One example will clarify this.

<sup>11</sup> See Swedish Handbook in Performance Audit, chapter 13 on descriptive statistics.

<sup>12</sup> Section 4.2. is partly based on the audit report Snabbare asylprövning (Speedier examination of asylum applications) NAO, Sweden, 2004.

There are different principles of handling incoming applications. "Taking the most time-consuming application first" is one principle; a second is "Taking the most time-consuming application last" and a third is the "First-in first-served" policy. Giving priority to the least complicated issues could be timesaving and cost cutting.

Let us compare the first two principles above (alternative 1: Taking time-consuming applications first, and alternative 2: Taking time-consuming applications last) when it comes to workload, waiting time and also the cost of clients' waiting time. To make it easy, we assume that in one office, four applications arriving at the same time should be prepared. One of the applications takes five working days and the other three take one working day each to prepare.

#### *Work load*

The work load for staff can be calculated as follows:

Alternative 1: Time-consuming application first:  $5+1+1+1= 8$  working days

Alternative 2: Time-consuming application last:  $1+1+1+5= 8$  working days

The same total amount of work is needed in both alternatives.

#### *Waiting time*

Even if the work load is the same, the average number of applicants in the queue waiting for a decision is reduced if the most complicated applications are taken care of last. This follows from the table:

	<b>Numbers of clients waiting</b>	
Day	Alternative1: Time-consuming applications first	Alternative 2: Time-consuming applications last
1	4	4
2	4	3
3	4	2
4	4	1
5	4	1
6	3	1
7	2	1
8	1	1
9	0	0
Average no. of clients waiting	2.89	1.56

The average number of clients queuing during these nine days in the case of Alternative 1 is 2.89. The average waiting time for the four clients is  $(5+6+7+8)/4= 6.5$  days.

The average number of clients queuing during the nine days in the case of Alternative 2 is 1.56. The average waiting time for the four clients is  $(1+2+3+8)/4 = 3.5$  days.

Summarised, the way applications are prioritised heavily affects waiting time and the number of clients waiting<sup>13</sup>.

#### *Costs linked to waiting*

Clients waiting for their application may have to leave their job to wait and thus not receive their salary. If salaries for clients waiting are also taken into account it will mean that Alternative 2 is also much cheaper here. The difference is  $4 \times (6.5 - 3.5)$  days  $\times$  (salary per day) = 12 days' salary. As applicants probably do not have to wait at the office all the time but can go back to their own work, this must be seen as a maximum.

### **4.3. When data for waiting time is not available**

Sometimes the auditor will not find statistics on waiting time for clients but instead quantitative data related to waiting time. To illustrate this we will take the example of an office processing applications.

In this example the auditors were able to trace the following statistics:

#### **Statistics related to waiting time for 2008**

- Stock of applications at the beginning of 2008 = 205
- Received applications 2008 = 1702
- Finalised applications 2008 = 1462
- Stock of applications at the end of 2008 = 445 (205 + 1702 - 1462)

From this data it is possible to calculate new relations regarding waiting time as follows:

- Number of received – Number of finalised applications =  $1702 - 1462 = 240$
- Average throughput time<sup>14</sup> for 2008 for one application =  $240 / 1462 = 0.164$  weeks

In this example the number of incoming applications exceeds the number of finalised applications and consequently the stock of applications as well as the waiting will increase.

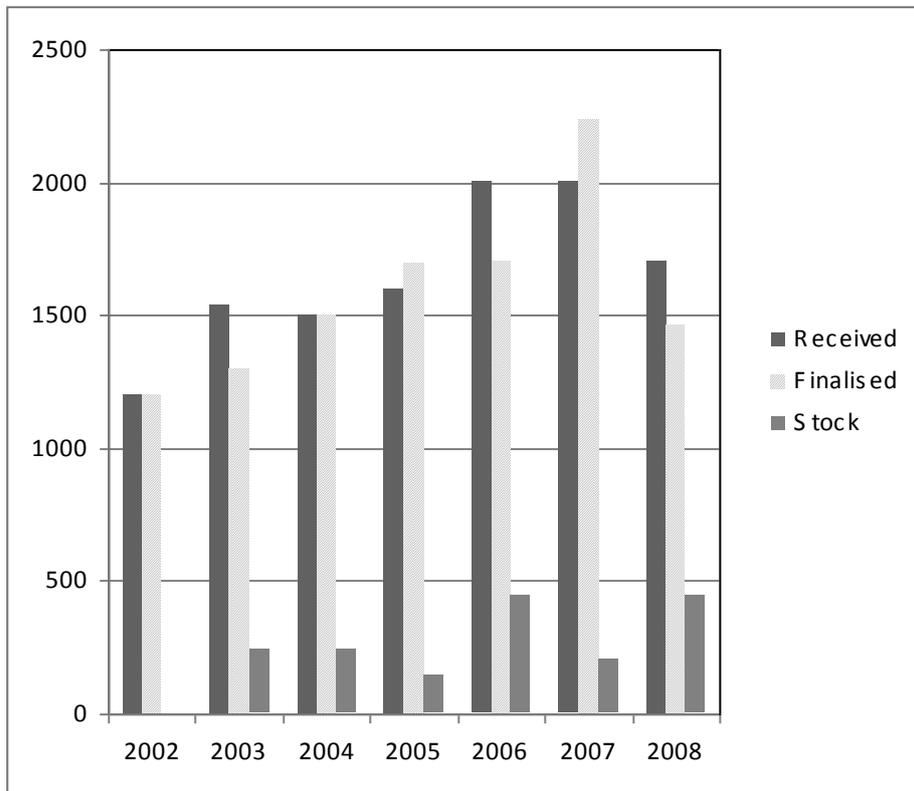
It is also possible to combine data in a trend for a number of years, which is illustrated in diagram 5.

---

<sup>13</sup> Please note that the different methods may have other effects on waiting time, which we do not measure in this example. Staff may, for example, find it tiresome to take on the most difficult cases at the end and this may affect their efficiency.

<sup>14</sup> Throughput time is the time it takes to process an application etc. calculated from the time the process starts. If there is no backlog, throughput time will be the same as waiting time but if there is a backlog of applications, for example, throughput time is the processing time recorded from the moment the actual handling of one specific application starts.

**Diagram 5: Applications received, finalised and in stock**



It is necessary to make some far-reaching assumptions if you want to calculate waiting time for an individual applicant using this data.

If we assume that all applications take the same time to process, the working pace is the same throughout the year and the office works according to the principle “First in – First served”, we are able to derive the waiting time for an applicant during 2008 as follows:

**Waiting time calculation**

Applications in stock at the beginning of 2008	X	Average throughput time for 2008	=	Time for completing almost all 205 applications	→	Waiting time for a new client applying on 1/1/08
205		(52/1462) = 0.036 weeks		205 x 0.036 weeks = 7.38 weeks	→	7.38 + 0.036 = 7.416 weeks

#### 4.5. Calculating efficiency and unit costs

Auditors may also choose to calculate efficiency and unit costs for the operations audited. Low efficiency and high costs are not the same as long waiting time (see chapter 2.5.) but still indicate that it is possible to shorten waiting time by making the production more efficient.

Based on the same data as above, the table offers guidance on how to calculate these measurements.

##### Calculating efficiency and unit costs

• Number of applications finalised	1462
• Number of staff handling applications	10
• Total cost for handling applications	25000 currency units

From this data it is possible to calculate unit costs and efficiency as follows:

• (Unit) costs for finalising one application = total costs for finalising applications/number of applications handled	(25000/1462) = 17.1 currency units per application
• Efficiency (number of applications finalised per year/number of staff)	(1462/10) = 146.2 applications per staff and year

The crucial issue when calculating unit costs and efficiency is which costs and staff should be included. This is a typical problem when staff members are carrying out several tasks, some of which are not related to the analysed service. The only way of systematically dealing with this is to use advanced financial management and time-measuring systems respectively. However, it is often possible to find short cuts by estimating how much time and money are allocated to the production of the analysed service.

## Guidelines on Performance Audit of Waiting Time

One of the strategic imperatives of the African Organisation of English-speaking Supreme Audit Institutions (AFROSAIE) is to develop performance audit. As part of this work AFROSAIE completed its *Manual on Performance Audit* in 2007.

Afterwards we realised that it would be beneficial for our SAIs to have access to guidelines on audit problems often encountered by our SAIs. Consequently AFROSAIE has decided to produce a series of guidelines of this type. These guidelines on waiting times are the first in this series and more guidelines will follow. We hope these guidelines will be useful when conducting performance audits on waiting time and efficiency issues.

If you have feedback on these guidelines or if you want to suggest topics for future guidelines you are welcome to contact the AFROSAIE Secretariat at [afrosaie@agsa.co.za](mailto:afrosaie@agsa.co.za)

You are also invited to visit our website at [www.afrosai-e.org.za](http://www.afrosai-e.org.za), where you will find new information on performance audit in the region.