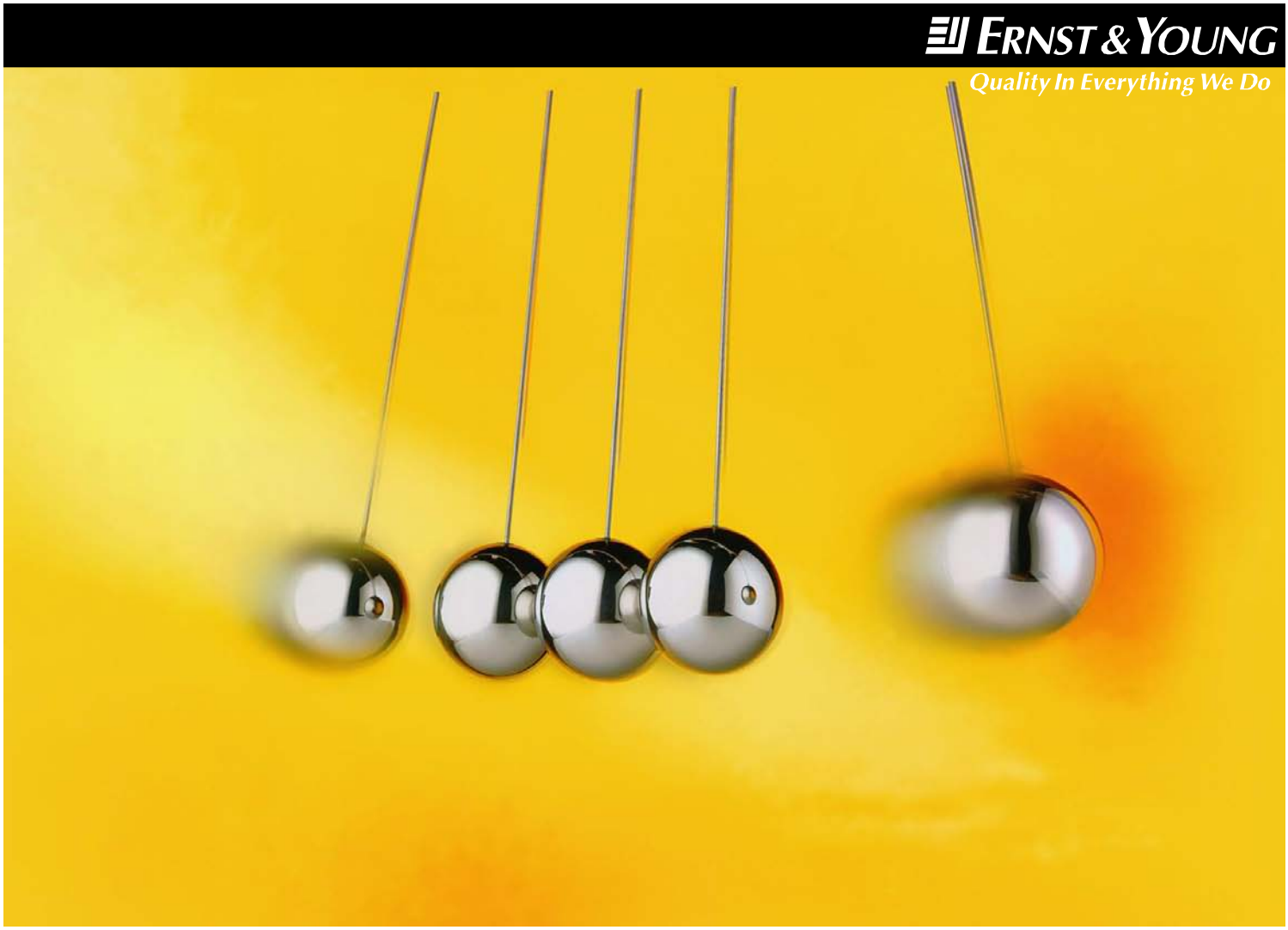
Final Report

Benchmarking Project – Productivity of the EPO, UKIPO & DPMA

Munich, June 29th 2007



Contents

Contents

1. Document control

1.1 Document History

Version	Key changes	Date	Author
Draft	Prepare preliminary final report	23.03.2007	Jan Schreiner, T. Fuggenthaler, W. Aleker
Preliminary 1		19.04.2007	Jan Schreiner, T. Fuggenthaler
Preliminary 2	Process remarks and change requests of the participating offices	21.04.2007	T. Fuggenthaler
Preliminary 3	Include executive summary	24.05.2007	T. Fuggenthaler, J. Schreiner
Final	Consider final comments / eliminate errata	15.06.2007	T. Fuggenthaler
	Adapt executive summary to reflect communication strategy	29.06.2007	T. Fuggenthaler

1.2 Document Approvals

Patent Office	Name	Title	Date	Version
EPO	Dr. Wolfram Förster	Head of Controlling Office		
DPMA	Dr. Friedrich Feuerlein	Leiter Hauptabteilung 1/II		
UKIPO	Sean Dennehey	Patents Director		

1.3 Abstract

Ernst & Young in cooperation with ManagementTeam has been engaged by the European Patent Office (EPO) to conduct a benchmarking study on the productivity of the EPO and the national patent offices UKIPO (United Kingdom) and DPMA (Germany). This benchmarking study included the comparison of legal environments, the comparison of the patent granting processes and the analysis of productivity, measured by 'time per action'-type of indicators, and productivity drivers, measured by specific key performance indicators. The analysis found that EPO's productivity falls significantly behind the level of the national offices and identified a 50% difference in productivity between the EPO and the national offices. This difference is to some extent caused by the methodical features, since effort for written opinions and the involvement of the examining division cannot be properly accounted for. The total effect of these features and eight other explanatory factors may explain a productivity difference of 35% – 45% with two factors remaining that may be able to explain the residual.

2. Executive Summary

Ernst & Young in cooperation with ManagementTeam has been engaged by the European Patent Office (EPO) to conduct a benchmarking study on the productivity of the EPO and the two national patent offices UKIPO (United Kingdom) and DPMA (Germany). In accordance with the assigned contract, the scope of the study is focused exclusively on the patent grant procedures, i.e. search & substantive examination performed by technically qualified examiners. Furthermore, the work performed does not consider criteria other than 'time', which means that quality or cost aspects are irrelevant for the purpose of this study.

As a pre-condition to allow a true and fair benchmarking, it is crucial to obtain a thorough understanding of the legal environment of the three offices. This step is necessary to distinguish between differences in productivity caused by legal differences, which are not under control of a patent office, and differences coming from other productivity drivers. For that purpose, the benchmarking study has started with a **legal comparison** of the respective patent laws.

Basically, all three offices grant patents only after a careful search & examination. The underlying statutory requirements are almost identical in substance, which is due to the fact that national patent laws of the EPC member states have been harmonised with the EPC.

However, some differences mainly concerning the grant process do still exist. Particularly, the EPO is required to establish an 'examining division' for each application in the examining stage, which comprises three patent examiners. At the national offices, there is only one dedicated examiner who has the overall responsibility for examination of a certain case.

Next, in order to establish a common foundation for measuring productivity, an **inventory of** the respective **patent granting processes** at each office is established. This activity is accompanied by an analysis of major deviations. Based on the inventory, a generic process scheme is generated which basically applies to all three offices, thereby also supporting comparability of the productivity measurement.

During the next project phase, coming to the core of the matter, a detailed **analysis of quantitative data** on the patent granting process is performed. This includes development of a methodology for measuring and comparing productivity, as well as identifying the root causes of the identified differences.

After intensive discussions with all participating offices, it has been agreed that the following two productivity measures are most useful for our purposes:

- **'Time per product** (P2)', which divides the capacity available for search & examination by the number of finals actions and searches
- **'Time per communication** (P3)', which differs from P2 by adding the number of communications in the denominator

Please note that another measure 'Time per final action (P1)' is not further used although being considered initially. This ratio does not yield comparable results, due to the fact that the EPO as an international search authority (ISA) has a much higher ratio of search reports in comparison with final actions.

Reliability and comparability of the measures depend very much on a precise definition of the variables final action, searches, and communications as well as the related capacity. It has been a significant effort to allocate each office's products to these variables.

Based on the data provided by the participating offices for the period from September 1st 2005 to August 31st 2006, the computation of 'time per product' yielded 1,1 and 1,2 days per product for

UKIPO and DPMA as compared to 1,7 days per product for the EPO ('P2'). The computation of 'time per communication' yielded 0,7 days per product for UKIPO and DPMA as compared to 1,1 days per product for the EPO ('P3').

The following conclusions can be drawn immediately from the productivity measures:

- Productivity of the UKIPO and DPMA is at the same level.

- The EPO's productivity as measured by P2 and P3 falls significantly behind the level of the national offices (approx. 50%).

For this reason, the investigation of potential causes mainly focuses on identifying factors which help explain the gap between the EPO and the national offices. This analysis is based on a set of key performance indicators, which have been derived from various productivity drivers covering process-related, input-related and environmental aspects. In addition, other aspects are considered systematically by conducting interviews with examiners at all offices (15 interviews each).

Bringing all this information together, a total of 12 'explanatory factors' is identified, which can be grouped into three major categories:

1. Differences coming from 'flaws' in the measurement systems used, which do not account for certain structural differences between the EPO and the national offices.

2. Differences of the applicable patent laws and patent systems between the offices

3. Differences attributable to the general environment of the patent offices (e.g. training & experience of examiners, language issues)

It should be noted, that these factors do include factors 'in favour' of the national offices as well as factors 'in favour' of the EPO.

The following factors contribute most to explaining the productivity difference:

- **Measurement of written opinions**:
  The EPO prepares written opinions on 82% of its searches, but only 58% of searches reach the examination stage. While this effort contributes to making the overall process efficient, it negatively affects productivity in the existing measurement framework, because the written opinions are not accounted for like a stand-alone product (⇨ category 1).

- **Involvement of the examining division**:
  As mentioned above, patent decisions at the EPO require the involvement of the whole examining division (examiner in charge plus two additional examiners), while final decisions at the national offices are the sole responsibility of one dedicated examiner per case. Likewise, the examining division is involved when it comes to oral proceedings (⇨ category 2). Obviously, this factor has a negative impact on productivity of the EPO compared to the national offices.

- **Applications not filed in an examiner's mother tongue**:
  EPO examiners are required to examine applications submitted not in their mother tongue, which may be difficult as it is crucial to thoroughly understand the claims. This may require a higher time investment. In addition, they are more likely to have to handle applications that were translated before filing, which may result in a loss of quality of the application document (⇨ category 3).

- **Motivational issues**:
  The evident difference in sickness days indicates that some sort of motivational issue exists at the EPO and is very likely to impact productivity (⇨ category 3).

In the aggregate, the total effect of ten quantifiable explanatory factors may explain a productivity difference of 35% – 45% between the EPO and the national offices (compared to 50% difference as measured by P2 and P3) with two factors remaining that may be able to explain the residual of the difference.

Please note that the quantitative assessment of the factors is based on a number of assumptions which are highly sensitive to variations. Nevertheless, all factors have been evaluated with due diligence and validated with representatives of all three offices, so they should provide a good and reliable overall picture of the actual situation.

It should be mentioned again that a substantial portion of the difference is a result of either the existing productivity measurement framework or the procedural environment (categories 1 and 2), thus is not necessarily an indicator for lower performance of individual examiners. Therefore, from a patent office's point of view, any improvement planned could only affect part of the measured productivity differences.

As a final remark, we would like to emphasize that throughout the whole project there was an extraordinary good cooperation and relationship between the participating patent offices and the consultant team. We appreciate the support provided by all three patent offices and hope that this study will promote the positive future development of all three offices.

3. Introduction

3.1 Background & Scope of the Study

The European Patent Office (EPO), the German Patent and Trademark Office (DPMA) and the United Kingdom Intellectual Property Office (UKIPO) have decided to carry out an independent study on the productivity of the three offices. The objective of the project was to collect data from the three offices with a view to comparing their performance and gaining information that will help them to take actions for improving their productivity.

In accordance with the terms of reference for the study, the following results were expected to be derived from the study:

(1) Highlight the differences in procedural and substantive examination requirements that are due to the legal environment of the three offices.

(2) Prepare an inventory of practices/procedures at all three offices to help identify factors that determine the level of efficiency and best practices in key processes.

(3) Develop and demonstrate indicators/ figures for productivity measurement

Formulate and discuss recommendations concerning best-practices.

The scope of the study has been strictly limited to the patent grant procedure in each office, i.e. search and substantive examination work on patent applications carried out by technically qualified patent examiners, looking at the time taken by them in carrying out the various actions in this process.

No attention was paid to such work as is done by staff other than search and substantive examiners, or to services or procedures offered by the three offices outside the patent grant procedure, including opposition and appeal proceedings. However, special attention should be drawn to the division of labour between patent examiners and support staff.

Moreover, no other parameters than time were deemed relevant for the purpose of this study, i.e. the criteria of cost and quality have not been considered in the evaluation.

3.2 Overview of the Project Approach

As a starting point for this project, the relevant features of the legal environment have been summarised in a "Legal Comparison Study" to ensure that a true and fair benchmarking of the productivity in each office has been possible, which would not be affected by systematic error stemming from legal differences. This step has also helped to better understand and explain at least part of the differences in productivity between the participating offices.

The project team has then created an inventory of relevant practices/ procedures for each of the three offices to serve as a common foundation for the benchmarking. Based on this process scheme, we have documented office-specific processes for search & examination and performed an analysis of major deviations. At this point, we have also considered the split of tasks between examiners & support staff.

As a next step, the project team – in close cooperation with the main contacts of the patent offices – has developed an approach for measuring productivity of the patent grant process for each office. It should be noted that this activity had to account for the availability and nature of information produced at each office, i.e. an approach had to be found to harmonize the different

productivity measurement tools in place at the respective patent offices. Otherwise, the accuracy and reliability of benchmarking results would have been seriously jeopardized.

Furthermore, (key) performance indicators were developed which should help to explain differences between the participating offices (e.g. experience of examiners, language issues, etc.). Due to the fact that those indicators were developed ex-ante, i.e. prior to actually measuring and comparing productivity, the selection of indicators was rather based on the experience of the contributing individuals. As a result, some of the indicators have been found to provide valuable information (ex-post), while a few others did not add much value for the purpose of this study.

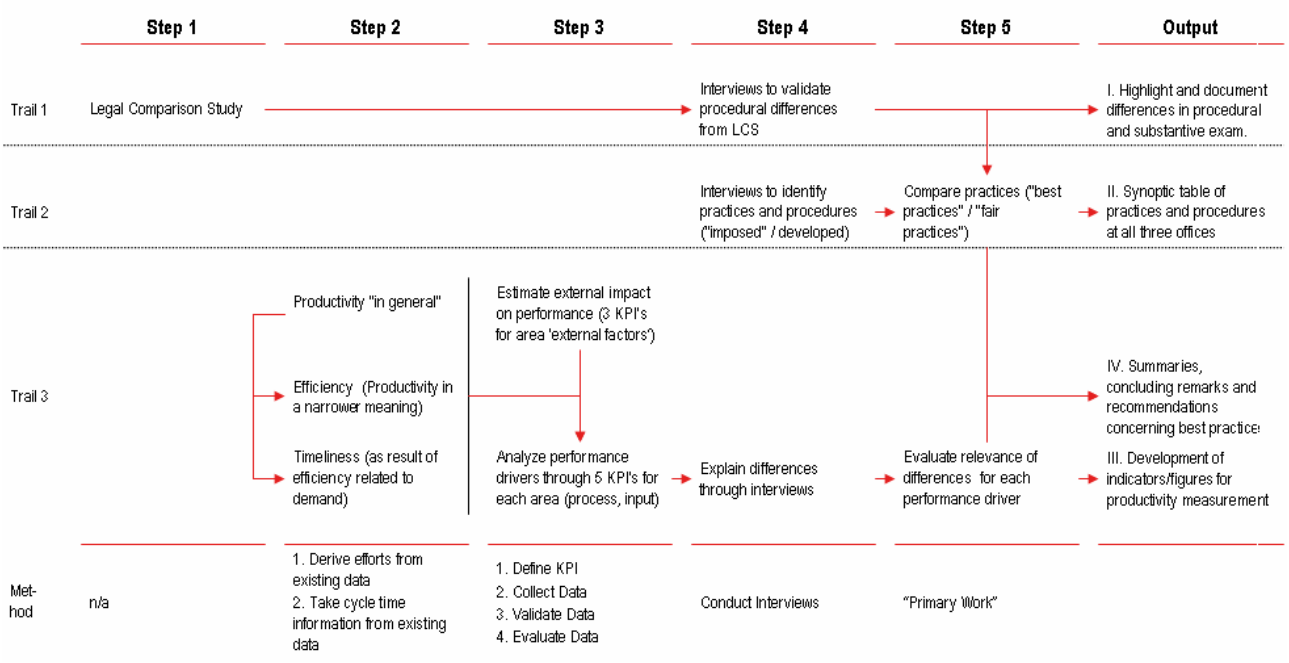
To validate the data collected, the project team has worked intensively with the three offices to ensure the accuracy and completeness of data. It should be mentioned that this exercise has required a lot of efforts from all involved parties, but was inevitable to achieve the desired quality of results.

In addition to the quantitative data described above, the project team has also conducted a number of interviews with active patent examiners at all offices (15 interviews each). The idea was on the one hand side to validate the interim results available at that time, but also to discuss qualitative differences between the offices and identify potential problems and “best practices”.

With the completion of the data collection, the project team started analyzing, comparing and interpreting the information available from the various sources. In a first step, the results were discussed with each office individually. Second, a joint meeting with the main contacts from all participating offices was conducted to discuss the interim benchmarking results and discuss potential causes for the identified differences.

Similarly, the project team has summarised recommendations for improvement from the information gained, which were also discussed and validated with representatives from the participating offices.

The following chart summarises the approach taken for conducting this study by connecting the key project steps with the expected output results:



4. Comparison of the Legal Framework

4.1 Approach

As a starting point for the study the features and differences in terms of substantive and procedural examination requirements under German and UK patent law, the EPC and PCT should be highlighted to allow a true comparison of the work done in the EPO, DPMA and UKIPO. In accordance with the terms of reference for the study no attention is paid to such work as is done by staff other than search and substantive examiners, or to services or procedures offered by the three offices outside the patent grant procedure, including opposition and appeal proceedings.

The three offices grant patents on any application only after a careful search and substantive examination as to patentability in accordance with statutory requirements which are almost identical due to the fact that the national patent laws of the EPC contracting states have been harmonised with the EPC. Differences, albeit not fundamental, mainly concern the grant procedure. Patent applications can be filed with each office either directly or via the PCT. Unlike DPMA and UKIPO, the EPO also acts as a PCT authority, i.e. as International Searching (ISA) and Preliminary Examining Authority (IPEA).

Search and examination are carried out by highly qualified examiners with an academic background in the relevant field of technology (some 3.500 in the EPO, 680 in the DPMA with 60% of examiners' time spent on search/examination, and 220 in the UKIPO). About 100.000 applications are processed by the EPO, and some 60.000 patents granted a year. With DPMA 60.000 applications and around 37.000 requests for examination are filed, and 17.000 patents are granted a year. UKIPO receives some 16.000 requests for a search, 12.000 requests for examination and grants 10.000 patents a year.

The legal framework as far as is relevant to the purpose of the study will be shown for each office individually, followed by a comparison of the three systems and concluded by a proposal as to how the further work should be conducted.

4.2 Legal Environment of the EPO

The following summary analysis of the grant procedure is based on the provisions of the EPC, the Implementing Regulations and the Guidelines for examination in the EPO as well as on the provisions of the PCT and the Regulations thereunder. It goes only as far as is necessary for the purpose of this study.

4.2.1 Substantive patent law under the EPC/PCT

For the subject matter claimed in an application to be patentable under the EPC it must be an invention within the meaning of Art 52 EPC which

- is novel (Art 54 EPC),
- involves an inventive step (Art 56 EPC),
- is industrially applicable (Art 57 EPC),
- is not excluded from patentability (Art 53, R 23b-e EPC), and
- is sufficiently disclosed in the application (Art 83, R 28 EPC).

In addition to these basic conditions for patentability any application must comply with a number of other substantive requirements regarding its contents, i.e.

- unity of invention (Art 82, R 30 EPC),
- description and drawings (Art 83, R 27-28, 32, 34, 35 EPC),

- claims (Art 84, R 29 EPC),
- priority right (Art 87-88 EPC),
- amendments to the application (Art 123 (2) EPC).

All these requirements are the subject of substantive examination and have to be checked by a technically qualified examiner and finally by the Examining Division. Examination normally focuses on novelty, inventive step, sufficiency of disclosure and claims.

Many other requirements concern formal matters, including fees which specialised formalities staff is responsible for, not normally examiners.

For proceedings under the PCT before the EPO as ISA and IPEA the basic patentability criteria to be looked at by an examiner are confined to novelty, inventive step and industrial applicability (Art 33 (2)-(4), R 64, 65 PCT) and correspond to those of the EPC. The same is true for the other substantive requirements under the PCT such as unity of invention, contents and drafting of description, claims and drawings, priority right and amendments (Art 5-8, 17 (3), 19 (2), R 5-11, 13 PCT).

4.2.2 The grant procedure under the EPC/PCT

The European grant procedure is, from a legal point of view, divided into two stages: examination on filing and as to formalities/search on the one hand, substantive examination on the other. While formalities throughout the procedure are checked by formalities officers, search and substantive examination are done by technically qualified examiners.

A search is carried out for any European application (Art 92 EPC), whereas substantive examination only takes place upon request of the applicant (Art 94 EPC). However, in practice both stages have more or less been brought together under the BEST program. Since July 2005 on any European application an extended search report (Rule 44a EPC), combining search and examination, is established at the same stage by the same examiner. The legal separation of the two stages remains, nevertheless, unaffected.

For proceedings under the PCT before the EPO as ISA the situation is very similar as since 2004 for any PCT application not only a search report will be prepared, but also an opinion as to the patentability of the claimed invention (Rule 43bis PCT).

The way a patent application is handled by the EPO in respect of search and examination depends on the filing route chosen by the applicant and hence on how the application is processed by the EPO, i.e. as

- EP direct filing,
- PCT filing (international phase)
- Euro-PCT application (European phase).

The three different procedures will be set out below in more detail.

4.2.2.1 EP direct filing under BEST

Search

Once the application has been accorded a filing date, and in parallel with the examination as to formalities, it is referred to a Search Division for establishing a European search report on the basis of the claims, with due regard to the description and any drawings (Art 92, R 44 EPC, Guidelines Part B). The search report shall cite the relevant prior art which may be taken into consideration in deciding whether the claimed invention is new and involves an inventive step.

This task is accomplished by a search examiner who normally is also a member of the later examining division, acting as so-called primary examiner entrusted with conducting the substantive examination before the examining division as a whole has to take a final decision on the case.

In carrying out the search, the examiner must normally

- read the application to understand the subject matter claimed by identifying the problem and its solution, the essential features, results and effects obtained,
- check the preclassification (assigned to the application by a special unit) and assign the final IPC classification symbols,
- check and translate the title of the invention,
- determine the final contents of the abstract (Art 85, R 33 EPC),
- check the application for unity of invention (before, during and after the search),
- design and, where appropriate, refine a search strategy enabling him to
- find the closest prior art by consulting the internal and external data bases comprising the search documentation of the EPO,
- assess the prior art documents found and their relevance,
- write a full or partial (R 45, 46 EPC) search report by citing all of the relevant documents and their category in relation to the claims concerned, or a declaration that a meaningful search was not possible.

Once the search report has been drawn up and transmitted to the applicant (with copy of any document cited), the search phase is completed unless the examiner established, for lack of unity of invention, only a partial search report. He must then prepare a reasoned objection which is sent to the applicant with an invitation to pay additional search fees for the other, non-unitary inventions identified in the report. In this case the examiner has to go on with a further search on those inventions (R 46 EPC) for which the applicant has paid search fees, so that in the end a complete search report on the application may be drawn up.

Following the introduction of the extended European search report (R 44a EPC, Guidelines B-XII) for any EP application filed as from 1 July 2005, the search report will henceforth be accompanied by what is called a “search opinion”. Once the search has been completed, the examiner has to write a preliminary, non-binding opinion on whether the application and the invention claimed therein seem to meet the requirements of the EPC, checking the application against all of the substantive requirements mentioned under I. The search opinion is thus equivalent to a first examination report (Art 96 (2), R 51 (2) EPC). It should be noted that under BEST quite similar an opinion is drawn up by the examiner for applications filed before July 2005, though it is not communicated to the applicant before a request for examination has been filed.

The search opinion may well be positive because the examiner has no or only minor objections to raise, and this conclusion will be summarised in a short statement. In most cases, however, the examiner will note one or more deficiencies regarding patentability or other requirements. In this case the search opinion should cover all objections to the application to be set out in a reasoned communication. Drawing up a negative opinion will no doubt require more time and effort by the examiner.

Search report (with copy of any cited document) and opinion are transmitted to the applicant, and this completes the search stage. The next stage is substantive examination if the applicant so requests no later than 6 months from publication of the search report (the opinion is not published but open to file inspection after the application has been published), Art 94 EPC, or where the applicant had filed an early request for examination, decides to proceed further with the application, Art 96 (1) EPC. From that moment the Examining Division is responsible for the application.

Examination

The Examining Division which normally comprises 3 technically qualified members examines whether the application and the invention to which it relates meet the requirements of the EPC (Art 94 (1) EPC). If such is not the case, the Examining Division invites the applicant as often as necessary to file his observations, to correct any deficiencies noted and to amend the description, claims and drawings within a specified period (Art 96 (2) EPC, R 51 (2) EPC, Guidelines Part C).

This task, as a rule, is carried out by the "primary examiner" who also processed the application at the search stage and is entrusted to do all the work necessary up to the point to grant a patent or to refuse the application. Substantive examination is guided by the over-riding principle that a final position (grant or refusal) should be reached in as few actions as possible, notably in the light of the so-called Paris criteria which call for an average duration of the grant procedure of no more than 3 years from filing. The starting point for the work of the primary examiner is the search report and the search opinion normally prepared by himself, and the further procedure very much depends on their results and the reaction of the applicant.

Where the applicant had filed an early request for examination, the search opinion was positive, and a top-up search by the examiner for conflicting applications did not reveal relevant documents, the first action may well be the communication under R 51 (4) EPC that the application is in order for grant. If in the search opinion objections were raised and the applicant did not respond by filing arguments or amendments, the first communication from the examiner will simply refer to the search opinion. If however the applicant responded to the opinion by submitting arguments and/or amendments to the application, the examiner must review the case and write a communication under R 51 (2) or (4) EPC.

The situation is similar where the applicant files a normal request for examination. Here again it depends on the outcome of the search report/opinion and the reaction of the applicant whether the examiner will simply refer to the search opinion, issue a R 51 (2) action or even proceed to the R 51 (4) communication. In some cases an additional search may be required on amended claims.

Where the examiner issued a first communication under R 51 (2) EPC and the applicant in his response does not meet all the objections raised in it, the examiner will in some cases issue a second communication if there are good prospects of bringing the proceedings to a positive conclusion. A third or even further communication is a rare exception. In many cases it may be a summons for oral proceedings where a final decision can normally be taken.

In his dealing with the application, the examiner may have a personal contact with the applicant or his representative on the telephone or during an interview at the office. In some cases formal oral proceedings before the Examining Division as a whole will take place, mainly if the applicant so requests, especially where the application is likely to be refused.

If the examiner finds that a final decision can be taken on the application he will recommend to the other members of the Examining Division that either a patent should be granted (positive votum) or the application refused (negative votum). In the first case he has to prepare an internal note summarising the reasons for grant. In the latter he must draft a reasoned decision setting out the grounds for refusal. If the Examining Division agrees with a positive votum, a R 51 (4) communication will be issued to the applicant, as the case may be, with minor amendments to the text of the application as required by the examiner. The final decision to grant a patent, once the applicant has met all the requirements under R 51 EPC, or to refuse the application has to be taken by the Examining Division as a whole.

To sum up, in carrying out the various tasks featuring substantive examination, the examiner must normally

- re-read, or at least familiarise himself with, the application, search report and opinion,

- read and assess the response(s) of the applicant, i.e. arguments and/or amendments submitted, and check the application in the light of them for compliance with the EPC requirements, including Art 123 (2) EPC,
- carry out a top-up search for conflicting applications and, where necessary, an additional search on amended claims,
- write one or more reasoned communications to the applicant, dealing with all objections,
- prepare a positive or negative votum on the application for the attention of the other members of the Examining Division, draft a reasoned decision if the application is to be refused,
- where appropriate, arrange personal contacts with the applicant/representative by the telephone or an interview and record the results of such discussions,
- where necessary, prepare and attend oral proceedings before the Examining Division and draft the minutes.

The other members of the Examining Division are formally involved if a final decision has to be taken, i.e. if they have to make up their mind on either a positive votum (about 65% of all cases) or a negative one (less than 5% of all cases), with a refusal of the application usually requiring much more time and effort than all other cases. The full Examining Division is also involved where oral proceedings are held. Then all three members must thoroughly familiarise themselves with the case and attend the hearing, and the primary examiner has to write the minutes of the proceedings.

4.2.2.2 PCT filing (international phase)

It should be noted that about 70% of all applications processed by the EPO are filed using the PCT. The EPO acts as a PCT authority, i.e. as International Searching Authority (ISA) and International Preliminary Examining Authority (IPEA), is a PCT Receiving Office and may be designated or elected Office.

PCT Chapter I (search and written opinion)

Where in an application filed under the PCT the EPO has been designated as the competent ISA, an international search has to be carried out to discover the relevant prior art, and an international search report will be drawn up by the EPO on the basis of the claims, with due regard to the description and any drawings (Art 154, 157 EPC, Art 15–18, R 33–43 PCT, PCT International Search and Preliminary Examination Guidelines, EPO Guidelines E- IX).

This task is carried out by an EPO examiner trained under BEST in substantially the same way as outlined for the search on an EP direct filing (see 1.1 above). Minor differences concern certain points such as subject matter the ISA is not required to search, checking the title of the invention (no translation required) and the abstract. Also as the procedure in case of non-unity is different: if the examiner raises an objection to this end, the applicant may pay additional search fees under protest which leads to a review of that objection by a panel comprising three members. It should further be noted that the EPO has limited its competence as ISA (and IPEA) for PCT applications relating to business methods.

In the end the examiner produces a full or partial search report, equivalent to a European search report, by citing all of the relevant documents and their category in relation to the claims concerned, or a declaration that a meaningful search was not possible.

For PCT applications filed as from 1 January 2004 the EPO examiner responsible for the search now also establishes a non-binding written opinion of the ISA (WO-ISA, R 43bis PCT) as to whether the claimed invention appears to be novel, non-obvious and industrially applicable, and whether the application complies with the other requirements under the PCT as far as they are checked by the ISA. The WO-ISA is similar to the EP search opinion but is, as a rule, confined to an assessment of the three basic patentability requirements and does not thus cover all objections to the application the examiner might raise. This suggests that the examiner will spend less time in making the WO-ISA.

Search report and WO-ISA are transmitted to the applicant and the International Bureau (IB) of WIPO, and this completes the search stage under PCT Chapter I. Where the applicant does not request international preliminary examination, the WO-ISA is transformed by the IB into what is called an "international preliminary report on patentability" (IPRP) which is sent to the designated offices and the applicant (R 44bis PCT).

PCT Chapter II (international preliminary examination)

Where the international search report (and WO-ISA) has been established by the EPO (or the AT, ES, FI or SE Patent Office), the applicant may file with the EPO as IPEA a demand for international preliminary examination which aims at formulating a preliminary, non-binding opinion on whether the claimed invention appears to be novel, non-obvious and industrially applicable (Art 155 EPC, Art 31-35, R 53-74, PCT International Search and Preliminary Examination Guidelines, EPO Guidelines E- IX).

The demand for IPE is constantly decreasing due to a number of recent changes to the PCT procedure, notably the introduction of the WO-ISA. The workload for the EPO caused by IPE work is diminishing accordingly. That is why the IPE procedure, no longer being a major factor influencing the production and productivity of the EPO, can be dealt with here only cursorily.

IPE is normally carried out by the same EPO examiner who produced the international search report, on the basis of the WO-ISA unless the applicant has filed amended claims under Art 19 or 34 PCT or when demanding IPE. As the second and final action the examiner will normally proceed to establishing the international preliminary examination report (IPER), taking account of the observations and/or amendments submitted by the applicant, as the case may be, during an interview with the examiner. A further written opinion will be issued only under exceptional circumstances. With the issuance of the IPER the procedure under PCT Chapter II is completed.

4.2.2.3 Euro-PCT application (European phase)

Once the international phase under PCT Chapter I or II has been completed, the applicant must enter the European phase before the EPO as designated or elected office if he wants to obtain a European patent. To that end the applicant must perform a number of acts (Art 157, 158, R 107 EPC, Guidelines E-IX, 5 and 6) within a period of 31 months from the earliest priority date. Compliance with these requirements will be checked by formalities staff. Where the application has validly entered the European phase the further procedure depends on whether or not the EPO was acting already in the PCT international phase as ISA and/or IPEA.

EPO was ISA/IPEA

The PCT search report as established by the EPO replaces the European search report (Art 157 (1) EPC). No supplementary search will be performed by the EPO, nor will it prepare a search opinion under R 44a EPC. Only where in the international phase a lack of unity objection was raised and not all of the inventions were searched, the applicant will be given an opportunity to have also the non-searched claims searched by paying further search fees (R 112 EPC). For the sake of completeness it should be noted that no supplementary search will be carried out for PCT applications filed before 1 July 2005 for which the international search report was drawn up by the AT, ES or SE Patent Office (the number of such cases is comparatively small).

Such a Euro-PCT application normally proceeds directly to substantive examination. It is usually conducted by the same examiner who was responsible for the PCT search, on the basis of the application documents specified by the applicant (as originally filed or amended), the international search report and the IPRP or IPER, and is substantially similar to substantive examination of an EP direct filing.

In many cases, given the work already done in respect of the application and the various options for the applicant to adapt the application to the results of the PCT search and examination reports, the application may on entering the European phase well be in such a shape that no further objections are to be raised by the examiner.

In all these cases the first action would be a communication under R 51 (4) EPC that the application is in order for grant, which means that the examiner had to do only little additional work in checking the application for compliance with the EPC requirements. If however the application is not in order for grant, the examiner has to go on and prepare a communication under R 51 (2) EPC in exactly the same way as for an EP direct filing, and the examining process may include all of the steps outlined under 1.2 above. The procedure should however be brought to a conclusion with this and a subsequent action, i.e. a positive or negative votum.

The EPO was not ISA/IPEA

Where for the PCT application entering the European phase the international search report, IPRP or IPER had been established by a PCT authority other than the EPO such as the USPTO or JPO, the situation is different.

In all these cases, including PCT applications filed since July 2005 and processed by the AT, ES, FI and SE Offices as PCT authority, first a supplementary search report (Art 157 (2) EPC) has to be drawn up by the EPO examiner in exactly the same way as for an EP direct filing (see 1.1), though some steps to be taken may be different or unnecessary (classification, title of invention, abstract, unity of invention). The R 112 EPC procedure may also apply. The supplementary search is carried out on the basis of the application documents, specified by the applicant on entering the European phase or shortly thereafter, which may considerably differ from the texts which formed the basis for the PCT work. Whilst the EPO examiner will certainly use the international search report as a starting point for his own search, he can never completely rely on it and thus will have to carry out the supplementary search as diligently as he would have to do if this search were the first one. Moreover the supplementary search will in almost all cases reveal further relevant prior art not cited in the PCT search report. The burden on the examiner in performing a supplementary search is therefore equivalent to the search work on an EP direct filing.

In addition to the supplementary search report the examiner has to draw up a search opinion under R 44a EPC, except in some special cases (see Guidelines B-XII,6). In writing the opinion, the examiner may to some extent take account and profit of the IPRP or IPER, if for instance the claims were not amended on entering the European phase, but is not legally required to do so. Drafting the search opinion on a Euro-PCT application is thus entirely equivalent to the work the examiner has to carry out in respect of an EP direct filing.

Once the supplementary search and opinion have been completed and forwarded to the applicant, the applicant is given a 6 months period to decide whether he wants to proceed with the application. If he does so, the application will proceed to substantive examination conducted by the same examiner, based on the international and supplementary search reports, the search opinion and the application documents specified by the applicant, maybe amended in reaction to the supplementary search report and opinion. The procedure is substantially the same as outlined under 1.2 and 3.1 above, but it appears that here more frequently the first action of the examiner will be a communication under R 51 (2) EPC because the application is not in order for grant yet.

4.3 Legal Environment of the DPMA

The following summary analysis of the grant procedure is based on the provisions of the Patents Act (Patentgesetz, PatG), the Patent Ordinance (Patentverordnung, PatV), and DPMA Guidelines

for search and examination (Recherche- und Prüfungsrichtlinien). It goes only as far as is necessary for the purpose of this study. Utility models are not the subject of this study.

4.3.1 Substantive patent law under the PatG

For the subject matter claimed in a national or PCT application to be patentable it must be an invention within the meaning of § 1 PatG which

- is novel (§ 3 PatG),
- involves an inventive step (§ 4 PatG),
- is industrially applicable (§ 5 PatG),
- is not excluded from patentability (§§ 1, 1a, 2 and 2a PatG), and
- is sufficiently disclosed in the application (§ 34 (4) and (8) PatG; Biomaterial-Hinterlegungsverordnung, BioMatHintV).

These basic conditions for patentability are identical to those of the EPC.

In addition any application must comply with a number of other substantive requirements regarding its contents, i.e.

- unity of invention (§ 34 (5) PatG),
- claims, description and drawings (§ 34 (3) PatG, §§ 9-12 PatV), abstract (§ 36 PatG)
- priority right (§§ 40, 41 PatG),
- amendments to the application (§ 38 PatG).

Also these provisions by large correspond in substance to those under the EPC even if their wording may differ.

All these requirements are the subject of substantive examination and have to be checked by a technically qualified examiner. Like in the EPO, examination by DPMA appears to focus normally on novelty, inventive step, sufficiency of disclosure and claims.

Many other requirements concern formal matters such as the form of application documents, time limits, fees etc. which to check specialised formalities staff are responsible for, not normally examiners.

4.3.2 The grant procedure under the PatG

Every patent application filed with DPMA is subject to a first examination as to obvious deficiencies (§ 42 PatG). On filing or later the applicant (or a third party) may request an isolated search on his application (§43 PatG). Independently of such a request, DPMA proceeds to substantive examination, if the applicant (or a third party) so requests no later than 7 years from filing the application.

Examination as to obvious deficiencies, search and substantive examination are the responsibility of an examining unit (Prüfungsstelle, § 27 PatG) which is for all substantive issues a single technically qualified examiner (technisches Mitglied des DPMA, § 26 PatG), competent in the relevant field.

The way a patent application is handled by DPMA in respect of search and examination to some extent also depends on the filing route chosen by the applicant and hence on how the application is processed, i.e. as

- national filing,
- PCT application (national phase)

The two somewhat different procedures will be set out below in more detail.

4.3.2.1 National filing

Examination as to obvious deficiencies

Once DPMA has received an application, it proceeds to this first examination (§ 42 PatG, Guidelines for examination Ch 2 / Prüfungsrichtlinien Kap. 2) which is a check for obvious substantive deficiencies such as those mentioned in § 42 (2) PatG and for obvious non-unity. In addition, the classification according to IPC, which triggers the allocation to an examiner, is performed within this first examination.

For this task the examiner in charge of the dossier is responsible who must therefore study the application documents even before a request for search or examination is filed. It should be noted however that at that stage the examiner is not required to proceed to an in depth analysis of the application, but simply has to check whether on the face of it the application obviously does not meet certain substantive requirements. If he so finds, the examiner has to write a reasoned communication to the applicant informing him of such deficiencies and inviting him to file his observations and to remedy the deficiencies noted. On reply from the applicant (observations and/or amendments) the examiner has to check again whether the application now meets all the objections raised or otherwise to prepare a decision refusing the application.

Check for compliance with a number of formal requirements is carried out by formalities staff.

Isolated search

Where the applicant (or exceptionally a third party) filed a request for an isolated search on his application under § 43 PatG, the examiner in charge of the application has to carry out a comprehensive (within the limits of any) search in the prior art to identify the published (prior art) documents which are to be taken into consideration in determining the patentability of the claimed invention (for details see the DPMA Guidelines for search).

In carrying out the search, the examiner must normally

- read the application to understand the subject matter claimed by identifying the problem and its solution, the essential features, results and effects obtained,
- design and, where appropriate, refine a search strategy enabling him to
- find the relevant (closest) prior art by consulting the internal and external data bases comprising the search documentation of DPMA (including those of the EPO),
- assess the prior art documents found and their relevance,
- write a full search report by citing all of the relevant documents and their category in relation to the claims concerned, or a declaration that a meaningful search was not possible.

It should be stressed that the examiner must perform a search on all of the claims even if the application actually lacked unity of invention, but no objection to this effect was raised when the application had been examined for obvious deficiencies. The transmission of the search report (with copy of any cited document) to the applicant completes the procedure under § 43 PatG.

Examination

In most cases the applicant (or exceptionally a third party) will file a request for examination with DPMA (on filing the application, shortly thereafter or later within the 7-years period, § 44 PatG) if he wants to obtain a German patent or to get at least a full assessment of the patentability of the subject matter claimed, e.g. on a first filing with a view to subsequent applications within the priority year. That request leads to search and substantive examination being carried out together by a single examiner up to, and including, the decision to grant a patent (§ 49 PatG) or to refuse the application (§ 48 PatG).

The examiner in charge of the dossier, assisted by formalities staff of the examining unit, examines whether the application meets the formal and substantive requirements under §§ 34, 37 and 38 PatG and whether the subject matter claimed is patentable under §§ 1-5 PatG. In carrying out this task, the examiner will first proceed to a search along the same lines as set out under 1.2 above or rely on the search report drawn up by him under § 43 PatG (without being bound by it), and then check whether the application meets all of these requirements and, if this is not the case, write a communication (Prüfungsbescheid) to the applicant inviting him to remedy any deficiencies noted (§ 45 PatG, DPMA Guidelines for examination Ch 3).

The search in this combined procedure should be as complete as an isolated search under § 43 PatG, and the first action on the merits should address all objections to the application and the invention claimed therein in a reasoned communication. In quite a number of cases, following such first action, the application is not pursued any further by the applicant. In some cases, if the application as filed is in order for grant, the examiner may straightforward proceed to the decision to grant, if the applicant agrees.

However, in the majority of cases, especially where the applicant actually wants to obtain a German patent, the first communication will raise one or more objections, and it then depends on the reaction of the applicant how the procedure will go on, bearing in mind that, like in the EPO, examination in DPMA is guided by the rule that a final position (grant or refusal) should be reached in as few actions as possible. Where the applicant in his response (arguments and/or amendments) does not meet all the objections raised, the examiner will in some cases issue a second communication if there are good prospects of bringing the proceedings to a positive conclusion. A third or even further communication ought to be a rare exception.

In his dealing with the application, the examiner determines the facts of his own motion, may formally summon the applicant or his representative for a hearing or informally contact him on the telephone or during an interview at the office, and may where appropriate take evidence by hearing the applicant, witnesses or experts (§ 46 PatG). In all these cases a hearing or the taking of evidence must be minuted by the examiner.

If the examiner finds that a final decision can be taken on the application he will either grant a patent, or refuse the application by a reasoned decision setting out the grounds for the refusal.

To sum up, in carrying out the various tasks featuring combined search and substantive examination, the examiner must normally

- read the application to understand the subject matter claimed by identifying the problem and its solution, the essential features, the results and effects obtained,
- check the application for unity of invention (before, during and after the search)
- design and, where appropriate, refine a search strategy enabling him to
- find the relevant (closest) prior art by consulting the internal and external data bases comprising the search documentation of DPMA (including those of the EPO),
- assess the prior art documents found and their relevance,
- write one or more reasoned communications to the applicant, dealing with all objections to the application or the subject matter claimed and by citing the relevant prior art documents in relation to the claims concerned,
- read and assess any response(s) of the applicant, i.e. arguments and/or amendments submitted, and check the application in the light of them for compliance with the requirements under the PatG,
- where necessary, carry out an additional search on amended claims,
- where appropriate, prepare and conduct a hearing with the applicant/representative and/or arrange other contacts by the telephone or an interview and record the results of such hearing or discussions,
- write a final decision to grant a patent, or to refuse the application by setting out the grounds for the refusal.

4.3.2.2 PCT application (national phase before DPMA)

Where an applicant, based on a PCT application, wants to obtain a German patent he must, after completion of the international phase under PCT Chapter I or II, enter the national phase before DPMA as designated office within a period of 30 months from the earliest priority date. Experience however suggests that the majority of PCT applicants will opt for the Euro-PCT procedure, thus having their case examined by the EPO rather than by DPMA, so that the number of such applications appears to be relatively small compared to the great number of national filings.

If the applicant is a resident of Germany and filed the PCT application with DPMA as receiving Office, the national phase starts immediately and no other steps are required. If the applicant wants the application to be examined, he must file a request for examination no later than 7 years from the international filing date and pay the fee for examination. In that case the international search report and IPRP or IPER were established by the EPO as the competent ISA/IPEA. In all other cases the applicant must perform certain acts (filing fee, translation of application, national agent) to validly enter the national phase, and the international search report and IPRP or IPER may have been established either by the EPO or by another PCT authority.

Once the applicant has filed a request for examination, the PCT application proceeds to substantive examination in the same way as a national filing (see 1.3 above). The DPMA examiner in charge will certainly use the international search report/IPRP or IPER as a starting point for his work, but may also carry out an additional search if he thinks this to be necessary, notably if the applicant submits amended claims. He is in no way bound by the results of the international search report/IPRP or IPER and may come to a completely different judgement on the case.

4.4 Legal Environment of the UKIPO

The following summary analysis of the grant procedure is based on the provisions of the Patents Act 1977 (PA), the Patents Rules 1995 (PR) and UKIPO Manual of Patent Practice (MoPP). It goes only as far as is necessary for the purpose of this study.

4.4.1 Substantive patent law under the PA

For the subject matter claimed in a national or PCT application to be patentable it must be an invention within the meaning of Sec 1 (1) and (2) PA which

- is novel (Sec 2 PA),
- involves an inventive step (Sec 3 PA),
- is industrially applicable (Sec 4 PA),
- is not excluded from patentability (Sec 1 (3) and (4) PA, Schedule A2 PA), and
- is sufficiently disclosed in the application (Sec 14 (3) PA, R 17 and Schedule 2 PR)

These basic conditions for patentability are identical to those of the EPC.

In addition any application must comply with a number of other substantive requirements regarding its contents, i.e.

- unity of invention (Sec 14 (5)(d) and (6) PA, R 22 PR),
- claims, description and drawings (Sec 14 (2)(b) and (5) PA, R 18, 20 PR),
- priority right (Sec 5 and 6 PA),
- amendments to the application (Sec 76 PA).

Also these provisions correspond in substance to those under the EPC though their wording may differ even considerably due to UK traditional statutory drafting style.

4.4.2 The grant procedure under the PA

Every patent application filed with UKIPO is subject to a preliminary examination for formal requirements (Sec 15A PA, R 28 PR). On filing or later the applicant may request a (isolated) search on his application (Sec 17 PA, R 28A PR). UKIPO proceeds to substantive examination (Sec 18 PA, R 33 PR), if the applicant so requests no later than 6 months from publication of the application (including the search report).

Preliminary examination, search and substantive examination are the responsibility of a division in the Patents Directorate, and for all substantive issues a single technically qualified examiner, competent in the relevant field, is responsible.

The way a patent application is handled by UKIPO in respect of search and examination to some extent also depends on the filing route chosen by the applicant and hence on how the application is processed, i.e. as

- national filing,
- PCT application (national phase)

The two somewhat different procedures will be set out below in more detail.

4.4.2.1 National filing

Preliminary examination

Once UKIPO has received an application, it proceeds to this first examination (Sec 15A PA, R 28 PR, MoPP Part 1, Sec 15A) comprising a check for compliance with a number of formal requirements, carried out by a formalities examiner and comparable to the EPO examination as to formalities. Cases are initially allocated to examiners dealing with the relevant subject matter, by non-technical formalities examiners. The examiner assesses whether each case has been correctly allocated and if not he is responsible for re-allocation by discussion with colleagues.

Search

Where the applicant filed a request for a search on his application under Sec 17 PA within the prescribed period (12 months from the filing date in case of a first filing, 2 months where priority is claimed), the examiner in charge of the application has to carry out a comprehensive (within the limits of any) search in the prior art to identify the documents which he thinks will be needed to decide, on a substantive examination, whether the claimed invention is new and involves an inventive step (Sec 17 (4) PA, for details see MoPP Part 1, Sec 17).

In carrying out the search, the examiner must normally

- read the application to understand the essential nature of the invention by identifying the essential features specified in the claims, and the purpose, results and effects obtained by the invention as described in the specification,
- check the application for unity of invention (before, during and after the search),
- draft a search statement, devise and, as the search proceeds, refine a search strategy enabling him to
- find the relevant (closest) prior art by consulting the internal and external data bases comprising the search documentation of UKIPO (including those of the EPO),
- assess the prior art documents found and their relevance,
- assign to the application the official classification (UK classification, IPC and ECLA),
- check the title of the invention and the abstract and, where necessary, amend them,
- write an internal search report, recording any information likely to be useful to the substantive examiner,
- write a covering letter and a full or partial search report by citing all of the relevant documents and their category in relation to the claims concerned, or a declaration that a meaningful search was not possible,

- write, where appropriate, an examination opinion if he identifies major issues in the application requiring substantial amendment.

The transmission of the search report (with copy of any cited document) to the applicant completes the procedure under Sec 17 PA.

Examination opinions (EOs) are prepared where the examiner finds substantial prior art, or there is an issue of excluded matter, or there are a large number of overlapping independent claims etc, and he considers it would be more efficient for the applicant to address these before full examination. The examiner will then issue an EO together with the search briefly covering those issues and requiring the applicant to address them. If the applicant has not addressed them by the time substantive examination is due, the examiner simply reissues the objections in the EO as an "Abbreviated Examination Report" (AER). The procedure is used at the examiner's discretion to improve the overall efficiency of processing.

In cases of excluded matter at search stage, the examiner has the option not to carry out a search and may issue an EO objecting to such matter whether or not the applicant has requested examination. Again, the examiner has discretion to choose which approach will be most efficient.

UKIPO receives significant numbers of "private applicant" cases, i.e. where the services of a patent attorney or lawyer are not used. In such cases (about 25% at application stage and about 10% at search stage) the examiner provides a higher level of guidance and advice, uses different letter forms with more explanation and generally spends more time assisting the applicant.

Examination

Once the application and the search report have been published (Sec 16 PA), the applicant may file a request for examination with UKIPO (no later than 6 months from publication, Sec 18 PA, R 33 PR) if he wants to obtain a UK patent or to get at least a full assessment on whether or not the subject matter claimed is patentable, e.g. on a first filing with a view to subsequent applications within the priority year. Where such request is filed at the same time as the search request, it leads to combined search and substantive examination. In this case, search and examination are carried out at the same time and the results of both are reported to the applicant. The applicant can respond immediately to the report, and continue this accelerated processing, or can let the case rest until the deadline for response is reached (after publication) and the case returns to a more normal processing timescale.

The examiner in charge of the dossier investigates whether, considering the results of the preceding preliminary examination and the search, the application meets the requirements under the PA and PR, including whether the subject matter claimed is patentable (Sec 18 (2) PA, for details see MoPP Part 1, Sec 18). If an EO has issued at search stage and no amendments were filed, the examiner will normally follow the AER procedure referred to above. The application is re-examined as often as necessary following re-filing of amendments and explanations by the applicant in response to examination reports. Like in the EPO, examination in UKIPO is guided by the goal that a final position (grant or refusal) should be reached in as few actions as possible. It should also be noted that there is a general time frame for putting an application in order, i.e. a period of 4 ½ years from the earliest declared priority or the filing date, or 12 months from the examiner's first action (Sec 20(1) PA, R 34 (1) PR) whichever expires later.

In carrying out this task, the examiner will normally proceed as follows:

- conducting a top-up search by checking other search reports and looking for conflicting applications,
- re-read the application, taking account of arguments and/or amendments submitted by the applicant in response to the search report and examination opinion, and any new prior art found in the top-up search,
- write a report stating all his objections to the application and inviting the applicant to file observations and amendments to remedy any deficiencies,

- read and assess the response of the applicant, i.e. arguments and/or amendments submitted, and re-examine the application in the light of them for compliance with the statutory requirements, including wether amended claims do not add new matter,
- where after applicant's response not all objections are met, proceed to a further written communication, telephone discussion or interview with the applicant/representative,
- carry out a further search where the claim is made broader, narrower or shifts its scope, and make a final search for equivalent foreign or EP applications,
- where the application is in order for grant, check the text and data required for publication, and send the application for grant,
- where the application is not yet in order for grant, offer the applicant a hearing and, in preparation for such hearing, issue a communication setting out the issues and arguments to be considered at the hearing,
- The hearing is conducted by a senior officer. The examiner attends, provides his view of the application and may be asked to draft the decision.

Where the application is the subject of combined search and examination, in principle, the same procedure applies and the same steps are to be taken, as outlined under 1.2 and 1.3 above. However, depending on the shape of the application as filed or amended during the procedure, the attitude of the applicant or other circumstances, some steps may be unnecessary or taken in a different order (for details see MoPP, Sec 18 Annex A). Combined search and examination is used in about 20% of all cases.

4.4.2.2 PCT application (national phase before UKIPO)

Where an applicant, based on a PCT application, wants to obtain a UK patent he must, after completion of the international phase under PCT Chapter I or II, enter the national phase before UKIPO as designated or elected office within a period of 33 months from the earliest priority date. Experience however suggests that the majority of PCT applicants will opt for the Euro-PCT procedure, thus having their case examined by the EPO rather than by UKIPO, so that the number of such applications appears to be relatively small compared to the great number of national filings.

The applicant must perform certain acts (fees, translation of application, where necessary) to validly enter the national phase before UKIPO, and the international search report and IPRP or IPER will have been established either by the EPO or by another PCT authority.

Once the applicant has filed a request for examination, the PCT application proceeds to substantive examination in the substantially the same way as a national filing (Sec 89B PA, MoPP Sec 89B; see 1.3 above). The UKIPO examiner in charge will certainly use the international search report/IPRP or IPER as a starting point for his work, but may also carry out an additional search if he thinks this to be necessary, notably if the applicant submits amended claims. He is in no way bound by the results of the international search report/IPRP or IPER and may come to a completely different judgement on the case.

It would be interesting in this context to learn whether the preceding PCT work carries more weight in practice if it was carried out by certain PCT authorities such as the EPO.

4.5 Summary & Conclusions

The preceding analysis of the three patent systems regarding search and examination of patent applications in the EPO, DPMA and UKIPO results in the following conclusions:

4.5.1 Substantive patent law

The statutory provisions under the EPC, the PCT, the German PatG and the UK Patents Act governing patentability and other substantive requirements, which have to be applied by technically qualified examiners of the three offices in searching and examining patent applications, are

identical in substance. Differences in respect of the time required and actually spent in carrying out search and examination cannot therefore be explained by a different legal framework.

4.5.2 The grant procedure

The grant procedures in the three offices are different, but not to such an extent that the differences shown would necessarily lead to the conclusion that the tasks and workload of examiners in the search and examination process could not be compared with each other.

Due to the EPO's function as a PCT authority, applicants have various options for filing and prosecuting their cases. For any EP direct filing now an extended European search report (EESR) is established by a so-called BEST examiner, combining search and examination at an early stage of the grant procedure. The subsequent substantive examination, carried out by the same examiner, is largely based on the results of that work. The final decision (grant or refusal) is however taken by an Examining Division.

Where the applicant opts for filing a PCT application, designating the EPO as ISA, the EPO examiner proceeds to an extended search report (ISR and WO-ISA), combining search and examination and comparable to an EESR, albeit less comprehensive. If a PCT application later enters the European phase before the EPO and the EPO was ISA, subsequent substantive examination, carried out by the same EPO examiner, is largely based on the results of that work. If the EPO was not ISA, the EPO examiner first establishes a supplementary European search report (plus search opinion) along the same lines as for an EP direct filing, and subsequent substantive examination is based on that report as well as to some extent on previous PCT work (ISR and IPRP/IPER drawn up by another PCT authority).

DPMA deals with a great number of national patent applications and, to a lesser extent, with PCT applications (national phase). On a national application the applicant may opt for an isolated search or substantive examination, carried out by a single examiner up to, and including, a final decision (grant or refusal). A request for examination leads to combined search and substantive examination, which may be based on a previous (isolated) search report. A PCT application on entering the national phase before DPMA directly proceeds to substantive examination, and the examiner will to some extent rely on previous PCT work (ISR and IPRP/IPER) done by the competent PCT authority. It appears that in the great majority of cases national applications are processed by DPMA under combined search and examination conditions.

Also UKIPO deals with a great number of national patent applications and, to a lesser extent, with PCT applications (national phase). On a national application the applicant may request first an isolated search (which may be accompanied by an examination opinion) and later substantive examination, both carried out by a single examiner up to, and including, a final decision (grant or refusal). Or the applicant may request combined search and substantive examination at the same time (about 20% of all cases). A PCT application on entering the national phase before UKIPO directly proceeds to substantive examination, and the examiner will to some extent rely on previous PCT work (ISR and IPRP/IPER) done by the competent PCT authority.

A comparison of the different procedures managed by the three offices shows quite a number of common features which help to create an inventory of common practices in the search and examination process. In all three offices search and examination of applications are carried out by a single examiner up to a final decision. Only in the EPO the final decision is a matter for an examining division with 3 members. In the EPO and DPMA most patent applications are the subject of combined search and examination, and if, like in the majority of national UK applications, substantive examination was preceded by an isolated search, the examiner can usually rely on his previous work. Proceedings in the EPO under PCT Chapter I or at the European stage following the PCT international phase are not totally different from those under the EPC in respect of an EP direct filing, even where the PCT international phase ran before a PCT authority other than the

EPO. Other differences in procedures are the existence of written opinions issued with search reports at EPO and (less frequently) at UKIPO while not being created at the DPMA, and the fact that the EPO has three procedural languages, in which documents may be filed and issued, with the respective national language being the only procedural language at UKIPO and DPMA.

Most frequently used procedures appear to be grant proceedings on national applications with combined search and examination in DPMA, on national applications with separate search and examination in UKIPO, and grant proceedings in the EPO on either EP direct filings (about 1/3) or PCT applications (about 2/3) after completion of PCT Chapter I either by the EPO itself or by another PCT authority.

The core tasks and responsibilities of an examiner in performing search and substantive examination seem to be identical or at least very similar, and can be summarised as follows:

Search

- reading the application to understand the subject matter claimed by identifying the essential features, results and effects obtained, applying the problem and solution approach or other method,
- assigning the final IPC classification symbols,
- checking title of the invention and abstract,
- checking the application for unity of invention (before, during and after the search),
- designing and refining a search strategy enabling him to
- finding the relevant (closest) prior art by consulting the internal and external data bases comprising the search documentation available to his office,
- assessing the prior art documents found and their relevance,
- writing a full or partial search report by citing all of the relevant prior art documents and their category in relation to the claims concerned, or a declaration that a meaningful search was not possible,
- writing a search opinion or WO-ISA (EPO) or an examination opinion (UKIPO, in some cases) which covers all or at least the essential objections to the application and the subject matter claimed.

Examination

- re-reading, where necessary, the application, search report and opinion,
- reading and assessing the applicant's response to the search report/opinion, i.e. arguments and/or amendments submitted, and checking the application in the light of them for compliance with the statutory requirements, especially whether any amendments filed do not add new matter,
- checking the application as filed or amended for unity of invention,
- carrying out a top-up search for conflicting applications and, where necessary, an additional search on amended claims,
- writing one or more reasoned communications to the applicant, dealing with all remaining objections,
- where appropriate, arranging personal contacts with the applicant/representative by the telephone or an interview and recording the results of such discussions,
- where appropriate, preparing, conducting or attending, and minuting a hearing/oral proceedings (in UKIPO a hearing is conducted by a senior officer),
- drafting/taking a final decision to grant a patent, or to refuse the application by setting out the grounds for the refusal.

5. Inventory of Patent Grant Processes

The establishment of consistent criteria for the comparison of the participating offices with each other has been an essential element of the benchmarking study. To ensure the highest level of acceptance of the results, it was necessary to make sure that the basic processes are comparable in all three offices and the findings of the study are understandable and conclusive. For this reason great importance was attached to the inventory and documentation of the office-specific patent grant processes and the creation of one comprehensive generic process for the three offices in order to ensure comparability.

5.1 Objective of the Process Analysis and Approach

In principle, the purpose of executing a process analysis was to detect the organisational structures and the underlying processes of the participating offices by the means of a snapshot of the actual situation. The emphasis was placed on a clear limitation of the field of investigation and the exclusive concentration on the patent granting process with the search & examination phases.

The inventory of the processes was carried out in a first step through the analysis of documents and manuals provided by the offices. This first step of analysis of provided documents has resulted in draft process flow descriptions. Afterwards, the draft processes were validated by the contact persons from each of the offices through a multistage sequence of interviews and joint reviews on completeness and correctness and further refined, when needed. In this context it was important to find a level of detail adequate for the purpose of this study: detailed enough to identify the office-specific characteristics, and generic enough to allow a comparison of the participating offices.

The illustration of the individual activities of the process flow and their connections to other adjacent functional areas was carried out with the process modelling tool 'MS Visio'. For simplification reasons and due to the better clarity the comparison of the office-specific processes was displayed in 'MS PowerPoint'. Thereby, it was possible to identify differences in the process flow, such as involved functional areas/roles, and at the same time a high degree of transparency could be achieved. This approach enables a quick analysis of which steps/activities are performed in all three offices, which are only partly carried out, and who is in charge of the work. In a further project step these identified differences were addressed and more closely analysed in the course of interviews which were carried out with 15 examiners at each office. Main results of these interviews are considered in chapter seven 'Results & Recommendations'.

To give an overview, the following results have been achieved during this project phase:

- Office-specific processes for Search & Examination (see Appendix E for process flowcharts).
- Analysis of major differences between the office-specific processes (see paragraph 5.2).
- Generic process for Search & Examination applicable to all three offices (see paragraph 5.3 and Appendix E).

All steps were carried out in close coordination with each office. The documented processes and comparison were reviewed by and discussed with the responsible contact persons of the three offices in bilateral meetings or in workshop with all participating offices, and have been aligned.

5.2 Comparison of the office-specific Processes

In principle any patent application is granted or refused by examiners of the three offices only after an extensive search and substantive examination under the terms of the statutory requirements. As mentioned in the legal comparison these statutory requirements are almost identical due to the fact that the national patent laws of the EPC contracting states have been harmonised with the

EPC. Nevertheless there are some differences, albeit not fundamental, which mainly concern the grant procedure.

Even though the grant procedures under EPC and PCT are similar in some areas, e.g. the substantive examination of a Euro-PCT application where EPO was ISA is equivalent to the work an examiner has to carry out regarding an EP Direct filing, the comparison of the office-specific processes is solely based on

- EP direct filings for EPO and
- national filings for DPMA and UKIPO

The reason for this is that the procedural differences between EP Direct filings and national filings are a lot less significant than the differences between EP direct and Euro-PCT procedures.

For the sake of completeness a comparison of product-specific processes based on the filing route chosen by the applicant and the processing of the application by the EPO (EP direct filing, PCT filing - international phase and Euro-PCT application - European phase) was performed (see Appendix E).

The following tables show the comparison of the search and examination phases at the individual offices and the identified differences (highlighted with grey lines). Necessary explanations regarding the processes are given by separate notes.

Comparison of the office-specific processes [1/6]

	Steps / Activities	EPO			UKPO			DPMA		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Allocation/Prelim. Exam.	▪ File application	X			X			X		
	▪ Constitute file and examination on filing		X			X			X(1)	
	▪ Pre-classification and routing (at EPO the pre-classification is done by Dir. 'Classification')						X			X
	▪ Secrecy check						X			X
	▪ Check for obvious substantive deficiencies									X
	▪ File allocation			X(2)			X			X
	▪ Check formalities (DPMA: incl. data entry)		X			X			X	
Search	▪ Analyse application			X			X			X
	▪ Assign classification			X			X			X(3)
	▪ Check title/abstract		.....	X		.....	X		.....	X(4)

- **Notes to the comparison:**

  (1) The DPMA is not performing an examination on filing at that point of the granting procedure. This is done by the formalities officer on a later date.

  (2) At EPO the file allocation is usually done by the Director or by the Gérant responsible for the specific subject field.

  (3) At DPMA the classification is already done by an experienced examiner within the file allocation.

  (4) The title and abstract of the application is checked during the review for obvious substantive deficiencies at DPMA.

- **Differences between the three offices:**

- Pre-classification and routing:
  - Contrary to the DPMA and UKIPO approach where the pre-classification is performed by examiners or formalities officers, the EPO has established an own directorate for this kind of work.
  - At DPMA experienced examiners meet on a daily basis in the so called 'Börse'. They come together in one room, discuss the filed patent applications and assign them to the appropriate department.
- Due to national security requirements DPMA and UKIPO are obliged to scrutinise any filed patent application. The EPO does not have such a check.
- According to § 42 PatG every patent application filed with DPMA is subject to a first check for obvious substantive deficiencies.

Comparison of the office-specific processes [2/6]

	Steps / Activities	EPO			UKPO			DPMA		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Search	Check unity of invention			X			X			X(1)
	Determine search strategy and perform query			X			X			X
	Consider Patentability						X			
	Refine query			X			X			X
	Read and assess found docs			X			X			X
	Write internal search report						X(2)			
	Write covering letter						X			
	Write search report			X			X			X(3/4)
	Write search/examination opinion			X(5)			X(6)			
	Forward search report (and opinion) to applic.		X			X			X(7)	
	Publish patent application		X			X			X	

- **Notes to the comparison:**

(1) At DPMA the check of the application for unity of invention should be done during the check for obvious substantial deficiencies, but is mainly done during the examination phase (an examiner at DPMA has to carry out a search on all claims even if the patent application actually lacks unity of invention).

(2) At UKIPO there is a differentiation between internal and external search report which is mainly due to the fact that the search and examination work of some applications are not carried out by the same examiner. The search examiner records on the internal search report any information which is likely to be of use to the substantive examiner.

(3) At DPMA only under § 43 PatG a full search report (by citing all relevant documents and their category, i.e. X, Y, A, etc.) is written and transmitted to the applicant.

(4) At DPMA no search/ examination opinion is prepared. The search report under § 44 PatG is only for internal use.

(5) EPO: the search report will be accompanied by what a 'search opinion'; this is a preliminary, non-binding opinion on whether the application seems to meet the requirements of the EPC.

(6) UKIPO: If major issues are identified in the application requiring substantial amendment and the examiner considers it would be more efficient for the applicant to address those issues before full examination, he writes an examination opinion (only applicable when combined search and examination is not being conducted).

(7) DPMA: No search or examination opinion is sent out to the applicant (see also point (3) and (4)).

- **Differences between the three offices:**
  - Consider patentability: An examiner at UKIPO can omit to search and/or can make an examination report if no useful search is possible because the invention is obviously not patentable, if e.g. the invention relates to a pure business method)
  - In addition to the internal search report the examiner at UKIPO writes a covering letter explaining plurality, excluded matter, inventive step citations, scope of search etc. as necessary.
  - As aforementioned under note (2) at UKIPO a so called 'external report' is generated based on the already prepared internal report for forwarding to the applicant.

Comparison of the office-specific processes [3/6]

	Steps / Activities	EPO			UKPO			DPMA		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Examination	▪ Request examination	X			X			X		
	▪ Check formalities		X			X			X	
	▪ Examine patent applicat. as filed or amended			X			X			X
	▪ Objections to be raised?			X			X			X
	▪ Write communication			X			X			X
	▪ Dispatch communication to applicant		X			X			X	
	▪ File observations / amendments	X			X			X		
	▪ Check formalities		X			X				X
	▪ Re-examine application			X			X			X
			.....			.....			.....	

- **Differences between the three offices:** There are no major differences within this phase of examination. The only obvious differences of the three offices are the facts that
  - at the DPMA the second item 'Check formalities' is conducted by a different functional role – by an examiner and not by a formalities officer;
  - at the DPMA deficiencies not related to the content of the application are checked by formalities officers prior to the publication phase. Amendments (except for new documents, which may contain new content, e.g. new drawings) that have been previously requested by the formalities officer are also mostly re-examined by the respective formalities officer.

Comparison of the office-specific processes [4/6]

	Steps / Activities	EPO			UKPO			DPMA		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Examination	▪ Write further communication/contact applicant			X(1)			X(1)			X(1)
	▪ Offer hearing and write hearing report						X(2)			
	▪ Request for hearing	X			X			X		
	▪ Hold hearing and write minutes			X			X			X
	▪ Make top-up search			X			X			X
			.....			.....			.....	

- **Notes to the comparison:**

  (1) When dealing with the application, the examiner may determine how to contact the applicant, e.g. if the re-examination of the application shows that there are still objections to be addressed, he must consider whether they can best be resolved by a further written communication, telephone discussion, a personal interview or a hearing.

  (2) Only UKIPO provides a hearing report to the applicant (see also next paragraph).

- **Differences between the three offices:**
  - Where the application is not yet in order for grant and the examiner and the applicant still fail to reach agreement, an offer of a hearing should be made by the UKIPO examiner. The examiner should issue a hearing report to the applicant. This report should define all the issues to be considered at the hearing, setting out the relevant arguments on each one. The other two offices do not issue a hearing report to the applicant.

Comparison of the office-specific processes [5/6]

	Steps / Activities	EPO			UKPO			DPMA		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Final stage grant	▪ In order for grant? (YES)			X			X			X
	▪ Recommend to grant			X						
	▪ Approve by Examining Division			X						
	▪ Prepare disposal to grant						X			X
	▪ Perform quality check								X	
	▪ Check formalities								X	
	▪ Inform applicant of decision			X			X			X(1)
	▪ Dispatch decision to applicant		X			X			X	
	▪ Translate claims	X								
	▪ Check formalities		X							
			.....			.....			.....	

- **Note to the comparison:**
  (1) DPMA: 'Erteilungsbeschluss'

- **Differences between the three offices:**
  - Recommend to grant and approval by Examining Division: Different to the other two offices the examiner at EPO is not allowed to take the decision to grant or refuse a patent application on his own. He has to consult with the other two members of the 'Examining Division'. The final decision to grant a patent or to refuse the application has to be taken by the Examining Division as a whole.
    - › If the examiner considers that the application satisfies the requirements of the EPC, he writes a brief report ('positive votum') and refers the application to the other members of the Examining Division. They consider the case individually and if there is agreement with the recommendation of the primary examiner, the application is in order to grant.
    - › If the examiner considers that the application does not satisfy the requirements of the EPC, he writes a brief report ('negative votum') and refers the application to the other members of the Examining Division. They consider the case individually and if there is agreement with the recommendation of the primary examiner, the application is in order to grant.
  - Prepare disposal to grant: Before achieving a final decision the examiners at DPMA and UKIPO have to carry out an additional intermediate step. If the examiner comes to the conclusion that the patent application is in order to grant, he should ensure that the data required for publication of the granted application are correct and up to date (DPMA: 'Erteilungsverfügung').
  - DPMA: Perform quality check: After preparing the disposal to grant a quality check of legal formalities is carried out by the group manager at DPMA and additionally a quality check of final classification is carried out by the examiner in charge of classification and documentation (BfKD).

    Even though the final decision is solely made by the examiner in charge there are two more examiners involved in the quality check.
  - Translate claims: If an applicant has filed its patent application at the EPO and the patent is granted he has to translate the claims. But this has no influence on the benchmarking, since this is not in the scope of the study.

Comparison of the office-specific processes [6/6]

	Steps / Activities	EPO			UKPO			DPMA		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
FS grant	▪ Take decision to grant			X			(1)			(1)
	▪ Publish patent specification		X			X			X	
Final stage refusal	▪ In order for grant ?(NO)			X			X			X
	▪ Recommend to refuse			X						
	▪ Approve by Examining Division			X						
	▪ Write decision to refuse			X			X			X
	▪ Dispatch decision to applicant		X			X			X	

- **Note to the comparison:**
  (1) There is no further step at DPMA and UKIPO, the final decision to grant the patent has been already taken.

- **Differences between the three offices:**

- At EPO the final decision to grant the patent can only be taken if the applicant has filed a translation of the claims.
- Recommendation to refuse and approval by Examining Division: see graph and description above.

5.3 Generic Patent Grant Process as Framework for comparing Productivity

The detailed description of differences between the patent granting processes has been shown and explained in the previous section. As a result of the analysis of these differences one can say that the differences between the three offices only to a very limited degree affect the core work areas of the examiners. The differences rather imply additional work steps of a more administrative nature, e.g. pre-classification at DPMA, secrecy check at DPMA and UKIPO, covering letter at UKIPO, second check of formalities at EPO etc.

With the definition and preparation of one generic process the following objectives were mainly pursued:

- getting a common understanding of the patent granting process at all three offices and
- obtaining an accepted list of basic steps/activities which then has served as a framework for comparing the productivity between the three offices

Based on the legal comparison study and its findings as well as on the comparison of the processes of the three offices and the analysis of their differences the conclusion can be drawn that creation of a generic process is a feasible approach.

In close cooperation with the three offices we have finally created one comprehensive generic process for search & examination, which is shown in the next four graphs.

Generic Process Model [1/4]

	Steps / Activities	cross-office		
		Applicant	Formalities Officer	Examiner
Prelim. Exam./Allocation	▪ File application	X		
	▪ Constitute file and examination on filing		X	
	▪ Pre-classification and routing			X(1)
	▪ Allocate file			X(2)
	▪ Check formalities		X	
Search	▪ Analyse application			X
	▪ Assign classification			X
	▪ Check title/abstract			X
	▪ Check unity of invention			X(3)
			.....	

- **Notes to the graph:**
  (1) EPO: The pre-classification is done by Directorate 'Classification' under Principal Directorate 'Tools and Documentation' and not by formalities officers or examiners who are doing the search & examination.

(2) EPO: The file allocation is usually done by the Director or by the Gérant responsible for the specific subject matter.

(3) At DPMA the check of the application for unity of invention should be done during the check for obvious substantial deficiencies, but is mainly done during the examination phase (an examiner at DPMA has to carry out a search on all claims even if the patent application actually lacks unity of invention).

- **Considerations for specification of indicators:**
  - File application by applicant:
    - How large is the share of private applicants (not supported by an attorney)?
    - How many applications, for which the procedural language is also the mother tongue of the applicant's country, are filed compared to all filed applications?
    - How many applications are examined by 'native' speakers (examiners whose mother tongue is one of the procedural languages)?
  - Pre-classification and allocation of files:
    - How good is the adequacy of initial file allocation?
    - How much time is spent by the examiner for re-allocation of the file?
  - Analyse application and check unity of invention:
    - How experienced are the examiners?
    - What is the average number of claims per application?

Generic Process Model [2/4]

	Steps / Activities	cross-office		
		Applicant	Formalities Officer	Examiner
Search	▪ Determine search strategy and perform query			X
	▪ Refine query			X
	▪ Read and assess found docs			X
	▪ Write search report (and examination opinion)			X(1)
	▪ Forward search report (and opinion) to applicant		X	
	▪ Publish patent application		X	
Examination	▪ Request examination	X		
	▪ Check formalities		X	
	▪ Examine patent applicat. as filed or amended			X
			.....	

- **Note to the graph:**

(1) Write search report (and search/examination opinion):

- UKIPO: An examination opinion is not prepared for all searches. Only if major issues are identified in the application requiring substantial amendment and the examiner considers it would be more efficient for the applicant to address those issues before full examination, he writes an examination opinion (only where combined search and examination is not being conducted).
- EPO: In the majority of the cases a search opinion is prepared in addition to the search report.

› DPMA: No search or examination opinion is prepared.

- **Considerations for specification of indicators:**
  - In general:
    - › What is the average number of sickness days per examiner?
    - › How much of the overall capacity of examiners is spent for Search & Examination?
  - Determine search strategy and perform query:
    - › IT applications/databases used for search: What is the percentage of downtime during business hours?
    - › How user-friendly are the search tools?
  - Write search/examination opinion:
    - › How many searches are prepared with search/examination opinion?

Generic Process Model [3/4]

	Steps / Activities	cross-office		
		Applicant	Formalities Officer	Examiner
Examination	▪ Objections to be raised?			X
	▪ Write communication			X
	▪ Dispatch communication to applicant		X	
	▪ File observations / amendments	X		
	▪ Check formalities		X	
	▪ Re-examine application			X
	▪ Write further communication/contact applicant			X(1)
	▪ Request for hearing	X		
	▪ Hold hearing and write minutes			X
	▪ Make top-up search			X
			.....	

- **Note to the graph:**

(1) When dealing with the application, the examiner may determine how to contact the applicant, e.g. if the re-examination of the application shows that there are still objections to be met, he must consider whether they can best be resolved by a further written communication, telephone discussion, a personal interview or a hearing.

- **Considerations for specification of indicators:**
  - Objections to be raised:
    - › What is the percentage of direct grants compared to total grants?
  - Write communication:
    - › How many communications are issued per grant or per refusal?
    - › How many communications are issued per withdrawal?
  - Request for hearing
    - › How many oral proceedings are held per grant or per refusal?
    - › How many oral proceedings are held per withdrawal?

Generic Process Model [4/4]

	Steps / Activities	cross-office		
		Applicant	Formalities Officer	Examiner
Final stage grant	In order for grant? (YES)			X
	Inform applicant of decision			X
	Dispatch decision to applicant		X	
	Take decision to grant			X
	Publish patent specification		X	
Final stage refusal	In order for grant ? (NO)			X
	Write decision to refuse			X
	Dispatch decision to applicant		X	

- **Considerations for specification of indicators:**
  - 'In order for grant?':
    - What is the ratio of granted patents compared to all applications for which an examination was requested?

5.4 Conclusions

The process analysis at all three offices was essential to get a clear understanding of the patent granting process, e.g. to comprehend which activities are part of the core work of the examiners (search & examination work on patent applications) and what kind of activities and the capacity spent on it have to be separated from the examiner's overall capacity. Furthermore, ensuring comparability of the three offices with each other is very important to achieve the highest level of acceptance of the final results of this Benchmarking Study. Then from the outset of the study it became obvious that the biggest concern of the involved persons was set on comparability (avoid 'comparison of apples with oranges').

Major differences between the three offices are not in the core work areas search & examination. Rather, the differences have to be seen in additional work steps of a more administrative 'nature', e.g. pre-classification at DPMA, secrecy check at DPMA and UKIPO, covering letter at UKIPO, second check of formalities at EPO etc. This shows that in principle a benchmarking of the patent granting process of the three participating offices is feasible and should provide reasonable results. There are some differences in the processes of the three offices as highlighted in this chapter, but the impact of these discrepancies did not make a comparison impossible.

Therefore we were able to prepare one generic process, for which we could receive approval from all participating offices. This was important for the acceptance of the defined indicators and of course of the comparison itself. This generic process serves as a framework for comparing the productivity between the offices ('inter-office') and between technical fields within one office ('intra-office').

With the definition and description of the generic process a concise and shared process picture arose that was intended to act as basis for the definition of performance indicators and for the determination of measuring points. The availability of data gave a limitation to this effort, e.g. the measurement of time and effort per activity was in particular not possible at EPO and UKIPO. Nevertheless, based on the generic process we could define useful performance indicators, e.g. ‘Adequacy of internal allocation’, valid for all offices.

6. Productivity of the Patent Grant Processes

6.1 Approach

Comparison of the legal environment of the three patent offices as well as creating a generic process for patent granting is a pre-requisite for conducting a meaningful benchmarking. The next step, getting to the core heart of this study, is about measuring and comparing productivity as well as identifying potential root causes for the measured differences. For this purpose our analysis addresses three levels:

- Level 1 – Productivity measurement itself

  The object of the analysis, 'productivity', needs to be measured first to identify the differences that eventually are to be explained, if they exist. This measurement is based on the current performance measurement framework, which is in place at each patent office. The existing elements have to be harmonized for enabling a true and fair comparison of figures.

- Level 2 – Measurement of 'explanatory factors'

  For this purpose of analyzing differences in productivity, hypotheses on what may explain the differences are proposed. For each of the hypotheses one or more indicators are defined, which allow for measuring to what extent underlying factors differ in the participating offices.

  Example: Given the hypothesis, that a higher complexity of applications will decrease productivity. For this hypothesis two indicators, '# 10 – number of claims per application' and '# 12 – share of private applicants', are defined, both measuring underlying factors, which – if not being the full determinants of complexity – contribute to complexity.

- Level 3 – Individual discussion with examiners ('interviews')

  For both deepening the understanding of the processes and validating of evolving conclusions, the study includes interviews with patent examiners at each of the three offices.

Taking this as starting point leads up to a major issue: While productivity measurement data is available at all three offices, the level of detail for data available by default (e.g. for reporting) for the measurement of productivity drivers is not sufficient for the purpose of this study. This is because performance indicators are typically captured at process level rather than activity level.

Therefore additional collection of primary data is required. This study includes additional (quantitative) information captured via data extraction from operating applications as well as qualitative information gathered from interviews with patent examiners. The latter includes:

- 'enablers' such as software applications for search or documentation;
- 'practices and procedures' within the patent granting process (i.e. activities below process level);
- other circumstances and conditions that enable / ease / hinder / prevent productivity.

6.1.1 Productivity measurement: 'time per action'

The starting point for the analysis is the measurement of productivity itself. The model applied in this study distinguishes three generic classes of actions (see appendix B for details), and relies on the assumption that similar products and similar product structures are in place at all three offices. Based on the common elements of the patent granting process (search → communications in the examination stage → final action at the end of the examination stage), three classes are defined and respective products are allocated to either

- the class of **final actions**, which are in general close to the processing of an application,
- the class of **searches**, which in general produce a designated search report not necessarily being distributed to the applicant, or
- the class of **communications**, which in general are written or oral (e.g. oral proceedings) interactions with an applicant, where objections are raised.

Please see appendix A (glossary) and B (productivity measurement definitions) for details regarding the definition of the three classes for each office.

The result of this model is basically information on the average time spent (in days) for one unit of production, again for the three generic classes of actions:

P1	**Time per final action**	(capacity for search & examination) / (number of final **actions**)
P2	**Time per product**	(capacity for search & examination) / **[**(number of final **actions**) + (number of **searches**)**]**
P3	**Time per communication**	(capacity for search & examination) / **[**(number of final **actions**) + (number of **searches**) + (number of **communications**)**]**

For each of these three indicators, the 'capacity for search & examination' is considered to be the relevant time component, as this excludes both external effects such as different vacation regulations and internal effects such as project work.

In order to allow for a true comparison of homogeneous action classes, product allocation to the classes rests on extensive discussions with the three patent offices. This indicator set is referred to as 'P1 – P3' or 'time per action' throughout this report.

Concurrently to this study, the Principal Directorate 'Means' at the EPO is in the process of developing a mathematical model for extracting 'time per action per product per joint cluster', known as 'partial efforts', from existing volume data.

The preliminary results available during this study have shown that this approach does not work based on mathematical results only. Incorporating 'business knowledge', i.e. additional information from joint clusters on restrictions and/ or average, is required for getting results, which are close to the actual values. Implementation of this complex approach at all three offices has been determined infeasible for the purpose of this project. Therefore, measurement of productivity is relying on the more generic model explained above.

6.1.2 Productivity drivers

For analysing differences in 'time per action' it is necessary to analyse data below process level. For this purpose the study deploys a concept of management theory, commonly known as 'value driver' analysis.

The basic idea of this methodology is to identify drivers, which influence the overall unit of measurement, which is productivity for this study. The following table provides an example of this approach:

Unit of measurement	→	Productivity Driver	→	KPI to be defined
Productivity	→	Applications of low quality (description, claims, figures) slow down work; these are submitted mainly by private applicants.	→	**Share of private applicants**
	→	Being allowed to work on projects rather than performing search & examination only is considered to be an incentive.	→	**Share of capacity available for S&E**
	→	Experience is considered to be the most important tool for patent examiners.	→	**Share of experienced examiners**

Based on the discussions with our contacts at the patent offices, the following productivity drivers are analysed during of this study:

A. Process

- A.1 Non value adding process steps are eliminated.
- A.2 Up-front effort may shorten the process.
- A.3 Quality requires effort.

B. Input

- B.1 Examiners have appropriate level of competence and experience.
- B.2 Examiners are provided an appropriate work environment.
- B.3 Examiners do focus on search & examination.

C. External Factors

- C.1 Applicant behaviour may prevent high productivity.
- C.2 Complexity of examined matter will reduce productivity.

Under each of this high-level productivity drivers there are one or more detailed productivity drivers (see appendix C for details), based on which the actual performance indicators, also referred to as 'KPI' (key performance indicators), were identified.

Stock-type indicators are measured at cut-off date August 31st 2006; flow figure-type indicators are measured for the time period September 1st 2005 through August 31st 2006.

6.1.3 Interviews

This study also includes interviews with 15 patent examiners at each patent office (Please note, that due to confidentiality reasons, the list of interviewees is not part of this report.). The purpose of the interviews is to validate the differences identified so far, and gather additional information on qualitative factors influencing the productivity.

The qualitative factors focus on identifying, assessing and evaluating the impact of the following surrounding elements of the patent granting process:

- existence and assessment of 'process enablers' such as software applications for search and/ or documentation as well as the availability and handling of patent literature and non-patent literature;
- elements of 'practices and procedures' within the patent granting process (i.e. activities below process level) with particular emphasis on procedures that may qualify for being 'leading practice';
- general circumstances and conditions that enable / ease / hinder / prevent productivity.

For the detailed contents, please refer to the interview guideline in appendix D.

6.1.4 Inter-office and intra-office benchmarking

One of the objectives of this study is to enable 'inter-office' as well as 'intra-office' benchmarking. Additionally, we have evaluated the potential to perform 'inter-office department' benchmarking by comparing specific technical fields between the three offices (e.g. EPO's Joint Cluster 'A' with DPMA's department 'B' and UKIPO's group 'C'). This would require the definition of a 'common denominator', which could serve as scheme for comparing departments among the patent offices.

Working with actual data, however, has shown that technical fields are organized so differently in the participating offices, that a definite 'one-to-one' or 'one-to-many' mapping is not possible. In fact a 'many-to-many' mapping applies for most cases. Therefore enabling this kind of comparison would require data comparison along the lines of a classification system, in particular the IPC. This, however, requires data capturing at patent application level, as most of the examiners are allocated subject matters from more than one section, so that allocating individual examiner production data to IPC sections does not work out.

Due to the fact, that data is not available to this level, a systematic inter-office department benchmarking does not work. For this reason, this study cannot provide the groundwork to advance on this, but provide the groundwork for enabling intra-office benchmarking and benchmarking of selected technical fields, where manual comparison is required.

6.2 Level 1 results: productivity measurement

Based on the definition of the productivity measures, the following results were obtained for measuring productivity at the three patent offices for the time period from September 1st 2005 through August 31st 2006:

Indicator	EPO [days]	EPO [%]	DPMA [days]	DPMA [%]	UKIPO [days]	UKIPO [%]
P1 Time per final action	4,49	173%	2,80	108%	2,60	100%
P2 Time per product	1,68	149%	1,16	103%	1,13	100%
P3 Time per communication	1,06	151%	0,72	102%	0,71	100%

The following primary conclusions can be drawn from this result:

- The indicator P1 has limited use only; emphasis should be placed on P2 and P3, respectively.

  The reason for this comes from the product structure. As the EPO serves as ISA, the ratio between searches completed in the period (search reports) and examinations completed in the period (final actions) is 1,7 as compared to 1,3 at the UKIPO and 1,4 at the DPMA. This means that the EPO has relatively more searches, which cause the normal workload, but do not show up as production in P1. Therefore drawing conclusions from P1 gives a skewed result, which is avoided, when P2 or P3 is used.

- The results for P2 and P3 remain fairly stable, both when comparing P2 and P3 with each other, and when performing a sensitivity analysis on P2.

  The difference between the offices among each other, expressed as percentage, does not change significantly between P2 and P3. EPO is +49% relatively to UKIPO at P2 and +51% at P3, resulting in a two percentage points change; similarly, DPMA is +3% relatively to UKIPO at P2 and +2% at P3, resulting in a one percentage point change.

  Furthermore, sensitivity analysis performed for slightly different definitions of P2 show, that the difference between EPO and UKIPO as well as between DPMA and UKIPO is fairly stable for different sets of assumptions. This supports the approach of placing P2 and P3 in the focus of the analysis.

- The productivity of UKIPO and DPMA is roughly at the same level.

  The difference between UKIPO and DPMA at P2 and P3 level ranges from 2% to 3%. Due to the fact that this study focuses on a 12 months period and does not include long-term comparisons, this difference may be attributable to special effects and random noise.

- The EPO's values for time per action are significantly above those of the national patent offices.

  Due to the fact, that productivity of the national offices can be considered to be at the same level, the analysis will concentrate on analyzing the difference between the EPO and 'the

national offices'. As the UKIPO sets the benchmark level for the time period analyzed, the difference that needs to be explained is the difference of +49% between EPO and UKIPO at P2 level.

As described in section 6.1, the analysis of the difference utilizes – besides the legal comparison (chapter 4) and the process comparison (chapter 5) – a comparison of underlying productivity drivers, which will be presented in the next section.

6.3 Level 2 results: productivity drivers

As described in section 6.1, the analysis follows the principle of defining potential productivity drivers and measuring them. The following table provides an overview of the selected productivity drivers and their results (please see appendix C for detailed definitions of the indicators):

ID	KPI	EPO	UKIPO	DPMA
1	**Experience of patent examiners** [percentage of examiners with at least 3 years of patent office experience]	86%	92%	83%
2	**Capacity for training & coaching** [Share of individual capacity spent for training & being trained as well as for coaching & being coached]	4,4%	9,8%	4,4%
3a	**Induction / early career training – classr.** [Amount of classroom training days according to policies]	59	83	30
3b	**Induction / early career training – tutor days** [Amount of tutor days according to policies]	39	35	n/a (not governed by policy)
3c	**Induction / early career training – period** [Length of period training in years according to policies]	4	5	2
4a	**Sickness days** [Average number of sickness days per patent examiner per year]	13,2	5,9	9,1
4b	**Sickness days – long-term** [Average number of long-term sickness days per patent examiner per year, i.e. sickness >200 days]	0,7	0	0,5
4c	**Sickness days excl. long-term** [Average number of sickness days per patent examiner per year, excluding long-term sickness >200 days]	12,5	5,9	8,6
5	**Availability of IT applications** [100% - percentage of downtime during business hours of IT applications/ databases used for search]	99%	99%	100%
6	**Capacity available for S&E** [Capacity for S&E as a percentage of total available time for examiners with >18 months of experience]	63%	63%	63%
7	**Adequacy of initial file allocation** [100% - percentage of cases that have to be re-distributed during the process to a different dpt.]	81%	82%	98%

ID	KPI	EPO	UKIPO	DPMA
8	**Share of direct grants** [Direct grants as a percentage of total grants, i.e. w/o one communication stating objections]	25%	7,3%	2,5%
9a	**Communications per grant** [# communications / # final actions for grants]	1,2	1,9	1,6
9b	**Communications per refusal** [# communications / # final actions for refusals]	2,4	1,4[1]	1,4
9c	**Communications per withdrawal** [# communications / # final actions for withdrawals]	1,2		1,1
10	**Claims per application** [# of independent and dependent claims per application]	18	23	15
12	**Share of private applicants** [# applications examined filed by private applicants / # applications examined]	1,7%	9,3%	3,8%
13a	**Withdrawals after first communication** [Applications withdrawn after first communication as a percentage of cases withdrawn during examin. stage]	57%	68%	60%
13b	**Withdrawals after search report w/ WO** [Applications withdrawn after SR with WO as a percent. of app. withdrawn during search & examin.]	13%	5,6%	n/a (no WO)
13c	**Withdrawals after search report w/o WO** [Applications withdrawn after SR without WO as a percent. of app. withdrawn during search & examin.]	8,5%	63%	35%
13d	**Share of searches delivered with WO** [Searches with WO as a percentage of searches with or without WO)]	82%	6,6%	n/a (no WO)
14a	**Oral proceedings per grant** [Number of oral proceedings in cases that are eventually granted / number of grants]	0,04	0,001	0,06[2]
14b	**Oral proceedings per refusal** [Number of oral proceedings in cases that are eventually refused / number of refusals]	0,71	0,02[3]	
14c	**Oral proceedings per withdrawal** [Number of oral proceedings in cases that are eventually withdrawn / number of withdrawals]	0,02		
15	**Cases filed in applicants mother tongue** [Applications filed in the language of the applicants origin country as a percentage of total applications]	53%	76%	83%

[1] *Data is only available for terminations, which include both refusals and withdrawals*
[2] *Data is only available in the aggregate; computing the aggregate for the EPO yields 0,06 oral proceedings per final action, too.*
[3] *Data is only available for terminations, which include both refusals and withdrawals*

ID	KPI	EPO	UKIPO	DPMA
16	**Cases examined by native speaker** [Percentage of examiners whose mother tongue is one of the procedural languages]	62%	99%	100%
17	**Ratio of decision to grant for applications in examination stage** [Applications that were granted as a percentage of final actions]	77%	75%	54%

For one group of the KPIs, the underlying productivity drivers are not considered further, either because of differences in the underlying definitions, which make them useless as too many other factors influence the KPI value, or because they place emphasis on other factors such as quality. In particular

KPI #3a Amount of induction / early career training – classroom

KPI #3b Amount of induction / early career training – tutor days

KPI #3c Amount of induction / early career training – length

are excluded, as the factual measurement does not capture the idea of the total investment (e.g. soundly including the productivity loss for newcomers and coaches, etc.), while the analysis of

KPI #10 Claims per application

shows that this KPI does not describe the complexity of the applications, as there are applications including only one claim, which is one and a half pages in length. Moreover the following KPIs were excluded as their focus is on the quality of the examiner's work, which was explicitly excluded from the scope of this study:

KPI #13a Share of withdrawals after first communication

KPI #13b Share of withdrawals after Search Report w/ WO

KPI #13c Share of withdrawals after Search Report w/o WO

KPI #17 Ratio of granted patents

A second group of the KPIs provide basically the same values for all three patent offices, and therefore the related productivity drivers are not considered as explanatory factors:

KPI #5 Availability of IT applications (software) / databases used for search

KPI #6 Capacity available for S&E

KPI #9c Communications per withdrawal

The third group of the selected productivity drivers provides significant differences, and hence is in particular considered to be explanatory factors:

KPI #1 Experience of patent examiners

KPI #2 Share of individual capacity spent for training / coaching

KPI #4a	Attendance to work
KPI #4b	Attendance to work (long-term)
KPI #4c	Attendance to work ex long-term
KPI #7	Adequacy of initial allocation
KPI #8	% of direct grants
KPI #9a	Communications per grant
KPI #9b	Communications per refusal
KPI #12	Share of private applicants
KPI #13d	Share of searches delivered with written opinion
KPI #14a	Oral proceedings per grant
KPI #14b	Oral proceedings per refusal
KPI #14c	Oral proceedings per withdraw.
KPI #15	Share of applications from applicants filed in their mother tongue
KPI #16	Probability of being examined by native speaker

These indicators will be discussed in detail in section 6.4.

6.4 Level 2/3 results: interpretation of evidence and explanatory factors from data and interviews

The results from section 6.2 require the explanation of a difference between the EPO and the national offices; for this purpose, the difference of 49% at P2 between EPO und UKIPO is taken as the amount, for which explanatory factors are sought.

Based on the legal comparison (chapter 4), the process comparison (chapter 5) and productivity driver analysis (section 6.3) supported by the interviews conducted and subsequent discussions with the patent offices, a set of pivotal elements is identified which contribute to explaining the difference in productivity between the EPO and the national patent offices. The factors in general are considered as contributing to explaining the differences between the EPO and both national offices, if not noted otherwise.

Basically, each of the explaining factors can be put into one of the following three categories:

Category 1: Differences between EPO and the national offices coming from **'flaws' in the measurement system**. Please note that this results from the basic measurement methodology being implemented at all three patent offices, which in general measure 'time spent / produced units' or vice versa.

These include:

Factor 1: Measurement of written opinions

Factor 2: Including oppositions in the measurement system

Category 2: Differences between the applicable **patent laws & patent systems** (all legal and internal regulations as well as the factual processing) governing the patent granting process at the patent offices.

These include:

Factor 3: Involvement of the examining division in final actions

Factor 4: Involvement of the examining division in oral proceedings

Factor 5: Time limit to bring an application in order

Factor 6: Adequacy of initial file allocation to examiners

Category 3: Differences in the **general environment** between the patent offices.

These include:

Factor 7: Applications not filed in the examiner's mother tongue

Factor 8: Examiners dealing with translated applications

Factor 9: Motivational issues

Factor 10: Training and experience

For each of the factors an evaluation of the impact is performed. Based on the assumptions made for each factor, the numerator and denominator for P2 are modified and P2 is recomputed in order to establish a difference between the P2 value as measured (see section 6.2) and the P2 value as it would be, if the factor under review did not exist. This evaluation, however, is highly sensitive on the assumptions performed.

Factor 1	**Measurement of written opinions**
Actual Situation	EPO prepares written opinions on 82% of its searches, but only 58% of cases reach the examination stage. One of the (intended) reasons is that some applicants will withdraw their application after receiving the written opinion because they do not expect a patent being granted. This written opinion causes effort similar to a first communication, but is not accounted for in the current productivity measurement framework. When the application gets to the examination stage, the effort for a first communication is saved, so that the total effort (search and examination) is about equal to an application without written opinion. So productivity measures at P3 level basically would be correct or close to. For the cases, when the application does not reach the examination stage, the effort saving effect at P3 level is lost. As the EPO has a higher share of applications being searched but not

	examined than UKIPO and DPMA, there is a greater distortion at the EPO.
Evaluation	Based on the assumption, that a written opinion causes the same effort as a first communication, we re-computed P2 for EPO reducing the capacity (numerator) by a factor 'lost written opinions times estimated effort for a written opinion based on P3', while leaving the production volume (denominator) unchanged. The resulting adjusted P2 value of the EPO is 13% below the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 1 explains **10-15 percentage points** of difference in productivity. It should be noted, that the estimation takes into account only those cases, where the additional effort for WO is actually lost, when there is no examination.

Factor 2	**Including oppositions in the measurement system**
Actual Situation	For EPO examiners and DPMA examiners, opposition work is included in the same time category as search & examination work. An opposition in general causes substantially more work than a final action. According to various discussions, the estimates range from 6,25 man days per opposition case (DPMA) to 10 man days per opposition case (EPO). As P2 measures the time spent for each product, which includes oppositions, this effect distorts the value of P2. This is particularly true, when EPO and UKIPO are compared, as UKIPO does not include opposition work or similar in the parameters, which define P2.
Evaluation	Based on the assumption, that the EPO spends 10 man days on a single opposition case, we re-computed P2 for EPO by reducing the capacity (numerator) by a factor 'opposition cases times estimated effort for an opposition' and the production volume (denominator) by the number of oppositions having occurred. The resulting adjusted P2 value of the EPO is 4,5% below the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 2 explains **3-5 percentage points** of difference in productivity. It should be noted that this factor also explains a part of the difference among the national offices (between DPMA and UKIPO). Using the methodology used before and applying the assumption of 6,25 man days per opposition case, the resulting adjusted P2 value of the DPMA is 2% below the actual value.

Factor 3	**Involvement of the examining division ('three man attendance') for grants and refusals**
Actual Situation	Patent decisions at the EPO require the involvement of the examining division (examiner in charge + two additional examiners), regardless of whether the patent is granted or refused (Art. 18 II EPC). This will cause additional effort for the examiner in charge (having to 'explain' the case to the others) and the additional examiners (for being involved), which will impact the P2 value of the EPO compared to the P2 values of UKIPO and DPMA.
Evaluation	Based on the assumption, that each additional member of the examining division has to spend 1,5 hrs for each decision and the examiner spends an additional 1 hr (giving a total of 4 additional hrs for each final action), we re-computed P2 for EPO by reducing the capacity (numerator) by a factor 'final actions times estimated additional effort' while leaving production volume (denominator) unchanged. The resulting adjusted P2 value of the EPO is 9% below the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 3 explains **5-10 percentage points** of difference in productivity.

Factor 4	**Involvement of the examining division ('three man attendance') in oral proceedings**
Actual Situation	Oral proceedings require the attendance of three examiners at EPO, while the UKIPO requires attendance of a senior examiner and the examiner in charge. This causes more effort due to the attendance of a third participant. In addition, oral proceedings occur in about 6% of cases at EPO and DPMA, compared to 0,4% of cases at the UKIPO. These two effects increase the effort spent on final actions and eventually impact P2.
Evaluation	We assumed, that an oral proceeding / hearing causes the effort of an additional man day for the third participant. In addition, we considered that an oral proceeding is more likely (probability of 6% compared to 0,4%) to occur at the EPO than at UKIPO. Based on this, we re-computed P2 for EPO by reducing the capacity (numerator) by a factor 'excess oral proceedings times estimated additional effort for third participant plus non-excessive oral proceedings times the effort for all three participants' while leaving production volume (denominator) unchanged. The resulting adjusted P2 value of the EPO is 3% below the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 4 explains **3-5 percentage points** of difference in productivity.

	It should be noted that this factor also explains a part of the difference among the national offices (between DPMA and UKIPO), as one root cause (higher percentage of oral proceedings) is true for the DPMA, too.

Factor 5	**Time limit for bringing an application in order**
Actual Situation	The UK patent law requires applicants to bring an application in order within a period of 4,5 years after the earliest declared priority or the filing date, or 12 months from the examiner's first action (whichever expires later). Otherwise, the application will be refused. This does not put a restriction on the number of replies / amendments from applicants to communications from the examiner, but the time limit puts some restraint on the number of communications an replies, and hence will at least contribute to the difference of communications required for refusals between EPO and UKIPO.
Evaluation	Based on the assumption that the excess of communications at the EPO in case of refusals (see KPI #9b) is caused by the non-existence of such legal requirements, we re-computed P2 for EPO by reducing the capacity (numerator) by a factor 'excess communications times effort for one communication' while leaving production volume (denominator) unchanged (as P2 does not consider the number of communications). The resulting adjusted P2 value of the EPO is 1% below the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 5 explains **1-2 percentage points** of difference in productivity.

Factor 6	**Adequacy of initial file allocation to examiners**
Actual Situation	According to KPI #7, both the EPO and UKIPO have a significantly lower adequacy of initial allocation of application to examiners compared to DPMA. In these situations files have to be re-allocated causing administrative effort, as well as additional efforts by the examiner to whom the application was initially allocated. This leads to in an increased effort, which would not have occurred, if appropriate allocation mechanisms were in place. It should be noted, that at DPMA and UKIPO reallocations occur because of a wrong allocation of applications to subject matters, having the applications being brought to the 'wrong' examiners. At the EPO, this happens, too, but reallocations also happen because of workload balancing: applications may be re-allocated to another examiner in another location, who is handling the same subject matters..

Evaluation	Based on the assumption, that each file reallocation causes 0,5 hrs of work, we re-computed P2 for EPO by reducing the capacity (numerator) by a factor 'number of reallocated applications times estimated examiners' effort for reallocation' while leaving production volume (denominator) unchanged. The resulting adjusted P2 value of the EPO is 3% below the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 6 explains **3-5 percentage points** of difference in productivity. It should be noted that this factor does not contribute to explaining the difference between EPO and UKIPO, but rather contributes to explaining the difference between EPO and DPMA as well as explaining the difference between UKIPO and DPMA.

Factor 7	**Applications not filed in examiner's mother tongue**
Actual Situation	EPO examiners are required to examine applications submitted not only in their mother tongue, but also in another of the procedural languages. Based on discussions with examiners outside the EPO, it was confirmed, that it is very important to thoroughly understand the claims of the application, which is more difficult if the claims are written in another language than one's own mother tongue. This is likely to cause additional efforts for the EPO examiner as he is more likely to spend some additional time for a clear understanding of claims. This effect is present at the national patent offices, too (see KPI #16), but due to the internationality of staff more prevalent at the EPO.
Evaluation	We assumed, that the examiners whose native language is not one of the EPO's procedural languages have to spend 20% additional time during search on understanding the claims and 5% additional time during examination on understanding amendments or re-reading the application. Based on this, we re-computed P2 for EPO by reducing the capacity (numerator) by a factor 'delta (between UKIPO and EPO) in probability for an application to be examined by native speaker times estimated additional time spent' while leaving production volume (denominator) unchanged. The resulting adjusted P2 value of the EPO is 8% below the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 7 explains **5-10 percentage points** of difference in productivity.

Factor 8	**Examiners dealing with translated applications**
Actual Situation	The majority of applications at the national offices come from the respective countries, while the EPO receives applications from a more dispersed basis (see KPI #15).

	For that reason EPO examiners are more likely to have to handle applications that are not written in the mother tongue of an applicant, but were translated into one of its procedural languages before filing. This may result in a loss of quality of the text of the examined applications, thereby also involving additional effort for processing.
Evaluation	Based on the assumption, that each translated application causes 5% additional work during search and examination, we re-computed P2 for EPO by reducing the capacity (numerator) by a factor 'number of translated applications times estimated additional effort' while leaving production volume (denominator) unchanged. The resulting adjusted P2 value of the EPO is 1,5% below the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 8 explains **1-2 percentage points** of difference in productivity.

Factor 9	**Motivational issues**
Actual Situation	KPI #3 (sickness days), which was taken into the analysis as a proxy for the measurement of staff satisfaction, indicates that motivational issues at the EPO may exist. They are likely to show up e.g. in an increased tendency to taking sickness days. These motivational issues in turn are likely to result in lower overall productivity at individual level, aggregating up to an impact at office level.
Evaluation	There is no reliable method for quantitatively estimating the impact of this factor at office level (e.g. based on the sickness days taken). For that reason there is no estimate of the contribution to explaining the difference, although there is little doubt that this issue exists and is very likely to influence productivity.

Factor 10	**Training and experience**
Actual Situation	According to KPI #1 the average length of service of the examiners of the UKIPO is higher than those of the examiners at EPO and DPMA, which are at the same level. The high value at the UKIPO is caused by an overall examiner staff reduction because of a decreasing number of incoming applications, which leads to a decrease in hiring new examiners (no newcomers since September 2004). According to KPI #2 the average time spent for training at UKIPO is higher than at EPO and DPMA, which among themselves are at the same level. The fact that examiners at EPO and DPMA seem to be engaged in projects to a greater extent (in terms of time spent) than examiners at UKIPO is considered to potentially be a

	major reason for this gap. Regardless of the root causes, this is likely to impact productivity, too, as experience is considered to be one of the "main tools of an examiner", as stated by several interviewees. It should be noted that this factor is not countered by the fact, that non-S&E-work is considered to be an incentive, as the share of capacity spent for search & examination work is the same at all three offices (see KPI #6).
Evaluation	Again, there is no reliable method to estimate the impact and the contribution to the explanation of the difference. Nevertheless, the effect does exist.

While it should be noted that there is some uncertainty in the assumptions underlying the calculations above, the explanatory factors 1 to 8 in the aggregate are likely to explain a difference of approx. 40% – 50%. Comparing this with the measured differences in productivity, i.e. 49% between EPO and UKIPO at P2 level being the yardstick, the identified factors are likely to be able to explain a significant portion of this difference. There are additional, non quantifiable factors (factors 9 and 10), which – while difficult to be measured – may eventually explain the residual difference.

These ten factors, however, are – to some extent – compensated by other factors, which would be expected to provide the foundation for higher productivity at the EPO:

Factor 11	**More direct grants at the EPO**
Actual Situation	The EPO has a higher rate of direct grants (see KPI #8), which may result from the filter function performed by national patent offices taking 'bad' applications out of the patent process in general. This is likely to decrease the efforts to be taken by the EPO for examining these applications, as no communications have to be written and no replies / amendments have to be processed.
Evaluation	Based on the assumption, that for each direct grant the average number of communications per grant (KPI #9a) is saved, we re-computed P2 for EPO by increasing the capacity (numerator) by a factor 'number of direct grants times average number of communications times estimated effort for one communication (P3)' while leaving production volume (denominator) unchanged. The resulting adjusted P2 value of the EPO is 4,5% above the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 11 increases the difference in productivity by **3-5 percentage points**.

Factor 12	Less private applicants at the EPO
Actual Situation	The EPO has a lower rate of applications from private applicants (see KPI #12). Common understanding is that applications prepared by non-corporations and non-institutions with the preparation not being supported by patent attorneys tend to have lower quality and require more effort.
Evaluation	We assumed, that, if the EPO had the same share of private applicants as the UKIPO, the additional effort would be 20% for each search and 20% for each communication. Based on this, we re-computed P2 for EPO by increasing the capacity (numerator) by a factor 'difference in share of private applicants times average number of actions (searches / communications) times additional effort' while leaving production volume (denominator) unchanged. The resulting adjusted P2 value of the EPO is 2% above the actual P2 value for this assumptions and data captured for the defined period. ➔ Factor 12 increases the difference in productivity by **1-2 percentage points**. It should be noted that the DPMA has a share of private applicants also significantly lower than the UKIPO; hence this factor also increases the difference between DPMA and UKIPO.

Netting factors 1 to 8 and 11 to 12 results in an aggregate explanation of the difference of approx. 35% – 45%. Comparing this with the measured differences in productivity of 49% between EPO and UKIPO at P2 level, the quantifiable factors are still likely to be able to explain a significant portion of this difference with two other factors (factors 9 and 10) remaining that may be able to explain the residual of the difference.

It should be noted that a substantial portion of the difference, as explained by factors 1 through 6, is a result of either the existing productivity measurement framework or the procedural environment, in which the EPO examiners have to operate, and is not necessarily an indicator for lower individual performance of examiners at the EPO.

In addition to the various factors discussed above, other hypotheses were investigated during the study which had to be disproved, i.e. these are not considered to contribute to explaining the difference:

- Technical field of applications

  A higher number of applications in complex subject matters compared to the number of cases in less complex subject matters has a significant impact on productivity.

  For this purpose, two 'super-clusters' were defined with one super-cluster having more than 1,9 days per product (Audio Video Media, Biotechnology, Computers, Electricity and Semiconductor Technology, Electronics, Measuring and Optics, Telecom) and the other super-cluster having less than 1,9 days per product (remaining joint clusters). Analysis shows that 41,2% of searches and examinations at the EPO occur in highly complex technical fields, but the same is true at the DPMA, where 40,5% of searches and

examinations occur in the respective technical fields. For the UKIPO, no such information was available.

As a consequence, the distribution of applications over technical fields does not explain the productivity difference between the EPO and DPMA.

- Combined Search & Examination

  The EPO does not have the possibility of doing a combined search & examination, where the separate work steps of searching and drafting an examination report can be integrated. According to interviewees this accelerates the work. However, if search reports are accompanied by written opinions (EESR / ESOP for European Patents, ISR / WO-ISA for PCT searches), this will compensate the effect, as the written opinion is very close to the first examination report, that will eventually be issued.

  As a consequence, the non-existence of combined search & examination at the EPO does not explain the productivity difference between the EPO and the national patent offices.

- Re-use of work by other patent offices

  The argument was raised that national patent offices may be able to reduce their work on a particular application by re-using the search reports and other documents produced by EPO examiners. While the possibility is in particular true for applications entering the national phase after the regional phase, this argument can be countered by the fact, that the EPO may be able to reduce its effort by re-using the search reports and other documents produced by national patent offices, in particular when the application was searched at the 'cheaper' national level before being filed at international level.

  An empirical review of a search report for a particular application filed at the EPO for a European patent before being filed with the Spanish patent offices for a national patent found that the search report was different, although the EPO results may have been re-used. The argument cannot be proved but also cannot be completely disproved (although the review mentioned may hint at disproving it) without empirically reviewing a large sample of search reports. For the time being, this factor cannot be considered as explaining the difference between EPO and the national offices.

It should be noted, that the quantitative analysis of explaining factors is performed for 'P2 – Time per product', as 'P1 – Time per final action' was deemed to be inappropriate for the purposes of comparing the three patent offices.

Furthermore it should be noted, that the factors which explain the difference at P2 level also hold true for 'P3 – Time per action' except for factor 5. This is in particular valid for factor 1, as the additional effort for written opinions for applications which do not enter the examinations stage is not compensated by actions at P3 level, as no P3 level actions occur without examination. This is in line with the fact, that the difference between EPO and UKIPO is almost the same at P2 and P3 level.

6.5 Comparison of selected technical fields

Subsequent to the analysis discussed in previous sections of this report, this study also includes a comparison of the productivity of selected technical fields, usually perceived as highly complex and therefore costly:

Indicator		EPO [days]	EPO [%]	DPMA [days]	DPMA [%]
		Joint Cluster Biotechnology		Abteilung 1.41 Bio- / Gentechnologie	
P2	Time per product	2,01	133%	1,51	100%
P3	Time per communication	1,03	118%	0,87	100%
	Share of searches and examinations	5,8%		2,9%	

Indicator		EPO [days]	EPO [%]	DPMA [days]	DPMA [%]
		Joint Cluster Computers		Abteilung 1.43 Informationstechnologie	
P2	Time per product	2,84	239%	1,19	100%
P3	Time per communication	1,70	255%	0,67	100%
	Share of searches and examinations	5,2%		4,3%	

Indicator		EPO [days]	EPO [%]	DPMA [days]	DPMA [%]
		Joint Cluster Telecom		Abteilung 1.31 Elektr. Nachrichtentechnik	
P2	Time per product	2,36	179%	1,32	100%
P3	Time per communication	1,41	175%	0,81	100%
	Share of searches and examinations	5,8%		2,9%	

It should be noted, that comparing technical fields at department level will not be able to provide for fully congruent match of technical fields, as the comparison is influenced by allocation of subject matters, as represented by IPC classes, to examiners and the assignment of examiners to departments. In particular, as the DPMA has 27 departments compared to 14 joint clusters at the EPO, a one-to-one match of an EPO joint cluster with a DPMA department, is likely to underestimate the 'share of searches of examinations' for the respective DPMA department.

Furthermore it should be noted, that this is not contradictory to the result above on the distribution of work among technical fields, as the analysis for this section does not include all of the technical

fields classified as being complex. The analysis made for section 6.4 comes from a distinction based on P2 results for the technical fields at the EPO, while the analysis for this section was made for selected subject matters, designated by the Steering Committee in its second Meeting on March 6th 2007.

6.6 Summary & Conclusions

- The productivity of the UKIPO and DPMA is at the same level, with the difference between UKIPO and DPMA at P2 and P3 level ranging from 2% to 3%.

- The EPO's productivity as measured by P2 and P3 falls significantly behind the level of the national offices, with the difference that needs to be explained ranging from +37% to +51%.

- Several quantifiable factors are likely to be able to explain a significant portion of this difference (35% – 45%) with other factors remaining that may be able to explain the residual of the difference. The following factors contribute most to explaining the difference:

    - EPO prepares written opinions on 82% of its searches with only 58% of searches reach the examination stage. While this effort contributes to making the overall process efficient, the effort itself drags down any productivity measurement as the written opinions are not counted as a stand-alone product.

    - Patent decisions require the involvement of the examining division for grants and refusals at the EPO.

    - EPO examiners are required to examine applications submitted not in their mother tongue, which may be difficult as it is crucial to thoroughly understand the claims. This may require a higher time investment. In addition, they are more likely to have to handle applications that were translated before filing, which may result in a loss of quality of the application document.

    - The evident difference in sickness days clearly points out, that some sort of motivational issue exists and is very likely to impact productivity.

    The factors related to the measurement of oppositions and oral proceedings also may be able to explain the difference between the UKIPO and the DPMA.

It should be noted that a substantial portion of the difference is a result of either the existing productivity measurement framework or the procedural environment, in which the EPO examiners have to operate, and is not necessarily an indicator for lower individual performance of examiners at the EPO.

7. Benchmarking Results & Recommendations

The main factors identified as contributing to the productivity difference related to either procedural differences governed in the EPC or the performance measurement framework. Nevertheless, besides these results depicted in chapter 6, the following leading practices were identified based on productivity driver analysis as well as interviews and should be considered for implementation:

1. Implement balanced performance measurement

   A balanced performance measurement should account for different products and procedures differently. Although assigning different weights to end products may be questionable, action / procedures / production steps within the patent granting process (such as e.g. oral proceedings / hearings) should be appropriately considered as production.

   In addition any such measurement should be integrated with a time recording system to provide the basis for consistent reporting by enabling the use of one dataset for comparing production and time and hence measure productivity.

   Furthermore, it may be considered to be mindful of the results of the data definition part of this study for enabling future comparison.

2. Provide opportunity for maintaining non-patent literature and maintaining patent literature (e.g. classification of other office's publications) by accounting for in assessing performance

   According to interviewees, documentation used for search and examination is considered to be – besides experience – the most important tool of examiners. If they are responsible for maintaining these, this may be accounted for in any performance measurement, as there is the risk otherwise, that this task may be reduced as much as possible for not impairing one's own productivity statistics, which hurts productivity later on.

3. Make non-patent literature (NPL) available electronically using the same user interface as for patent literature

   Making non-patent literature, which is usually subject to copyright laws, available electronically, in particular when the search application is publicly accessible via Internet has to care for copyright restrictions. Nevertheless external database already being subscribed by the patent office may be technically integrated in the user interface used for search.

4. Provide for online access to all relevant NPL sources (e.g. publishers of journals), if not available through search application

   In case that outside NPL is used in the search or examination stage any document found is – to some extent – likely to not be cited by the examiner, if he has to wait for postal delivery. If available electronically and therefore immediately at the time of search, the document will be cited (if applicable); if available upon order and postal delivery (min. 2 days delay), the search is likely to be closed, so that it will not be used. Therefore online access with the possibility of immediate access by download may improve the output.

5. Enable examiners to 'be in touch' with industry (e.g. industry visits)

   Getting an insight into the actual use of the technology and inventions examined provides for better understanding of the subject matter. In addition this may also be seen as an incentive enhancing motivation.

6. Allow for fax to be used as a means of communication (fax servers)

   During application work prior to publication, e-mail cannot be used as a means of communication because of confidentiality issues. In this cases the usage of fax servers, enabling examiners to electronically and immediately access incoming faxes or create outgoing faxes from e-mail without passing information through the internet. (This, however, creates the need for an amendment of examinations guidelines to ensure, that all inbound and outbound 'eFax' is put into the physical paper file of the respective application.)

7. Provide 'tools' for handling 'difficult' applicants (e.g. UK requiring applicants to 'have application in order 4,5 yrs after filing')

   Any changes related to this regulation, however, are likely to require changing applicable patent law. Nevertheless, changes to internal guidelines for search and examination, which are available to the applicants via web sites, may be adapted to provide for regulations easing the handling of difficult applicants.

8. Provide tools to the individual examiner for individual production scheduling

   Usually, each examiner has a stock of at least 50+ applications that require either search or examination or both within differing deadlines. The examiner may be supported by tools that provide exactly this information.

9. Provide maximum features in search tools

   EPOQUE and Depatis provide, according to interviewees, mostly the same features. Nevertheless some examiners use both tools as they are different regarding some useful detail features. For that reason a detailed comparison should be considered.

10. Use examiner experience in the allocation process

    Allocation of files – although contributing to a small part only – may be enhanced, if examiners are involved in this process, as they are likely to have the deepest understanding of technical fields and most experience in identifying the actual invention in an application.

11. Implement a regular benchmarking process

    For tracking any changes that are about to be made, both resulting from future changes in the product structure and resulting from adjustment made subsequently to this or other studies, a continuous benchmarking process should be implemented (see chapter 8 for details).

    Such benchmarking should take place at least bi-annually and re-use the data definitions made for enabling time series analysis.

It should be noted, that implementation of any of these practices requires a deepening analysis for both detailing the differences among the patent offices and applicability from a legal and performance point of view.

For the enhancement of this study and its results, it may be furthermore advisable to take one or more of the following options:

- Set up a benchmarking roundtable with representatives from all three patent offices to discuss the applicability and requirements for implementation of the aforementioned leading practices

- Expand the benchmarking to partial efforts upon full implementation of this method at the EPO

- Deepen the legal comparison by comparing the accompanying guidelines for search and examination at each office

- Expand the benchmarking to other patent offices including the big offices outside Europe, as the dataset defined is stable and not tied to one particular legal system and therefore may be – depending on the other offices databases – portable to other patent offices

8. Concept for Ongoing Productivity Benchmarking

8.1 Basic Understanding of Benchmarking

Benchmarking is a continuous process of comparison, projection, and implementation. It involves measurement of an organisation's performance against its peers to achieve the following results:

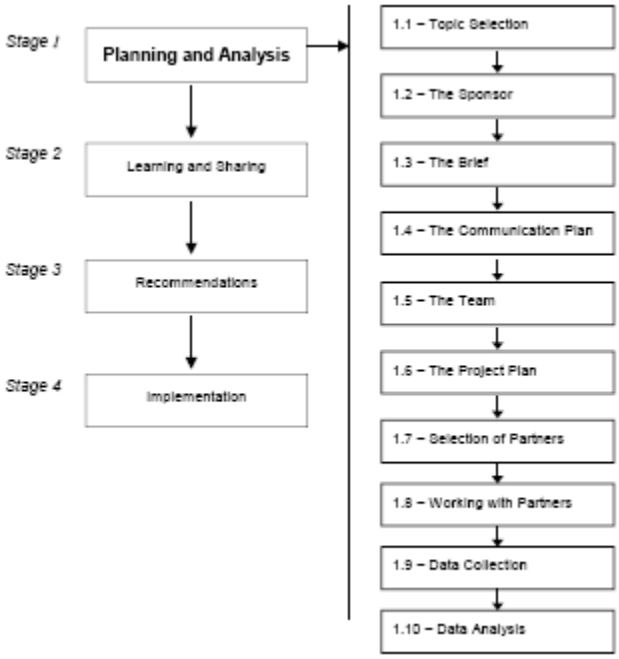
- Provide meaningful performance information.
- Improve strategic planning and provide an assessment of the organization's strengths and weaknesses.
- Establish challenging performance goals and stimulate better operational management.
- Foster implementation of best practices and lead to increased efficiency in the use of resources.

This type of continuous improvement can be achieved in an environment that embraces the process of benchmarking and the adoption of best practices.

8.2 Benchmarking Process

Basically, four stages need to be carried out in a benchmarking project/ program.

During the first stage 'Planning and Analysis', several steps have to be taken to ensure a proper setup of the benchmarking program. The stage also involves the data collection and data analysis steps. For the purpose of this study, this stage has been predominant.

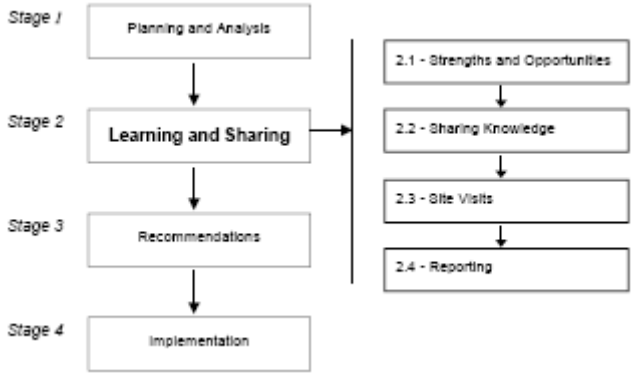


It is now important to move on to the next stages and see how the participating offices can utilize the results from stage one to drive performance improvements in their organisations.

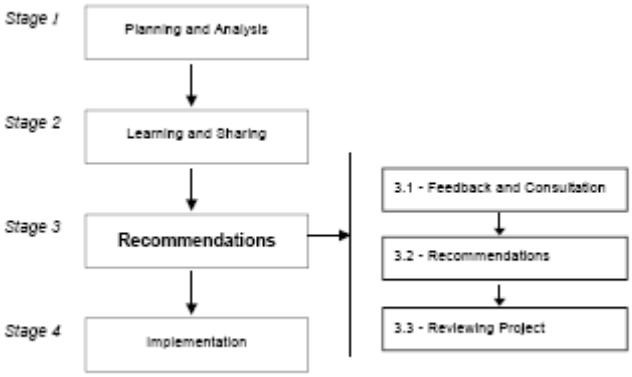
Stage 2 'Learning and Sharing' is about identifying the key opportunities for further improvement and to systematically share the relevant knowledge between the offices with the ultimate objective to learn from each other. As mentioned before, conducting one or more facilitated workshops with

key stakeholders from each office would be an adequate vehicle to discuss lessons learnt and promote best practices.

The workshop participants should be made up of individuals who are most knowledgeable about internal operations, are more likely to be affected by the changes due to benchmarking, and who are flexible and open to change. Eventually, these team members will become the change agents in their organizations.



In stage 3 'Recommendations', the idea is that each participating office (individually) brings the knowledge gained during the previous stages into the organisation and starts internal discussions on the identified opportunities for improvement. Based on the outcome, a clear and obliging action plan should be established for each measure to be taken (incl. timeline, responsibilities, etc.). Senior management in this stage should reiterate its expectations and express his support for the ongoing and planned improvement activities.



Finally, in the 'Implementation' stage, it is crucial that a continuous project management and controlling is maintained to ensure that the desired outcomes actually will be achieved.

8.3 Considerations for continuous benchmarking

A lot has been achieved during this study which can be used as a basis for future benchmarking activities. What we would recommend is to establish a platform for continuous benchmarking by assigning designees from each participating office to a 'Patent Office Benchmarking Group'. It is crucial that such a group is obtaining strong support by senior management.

The mission of this group would be to create value for the participating patent offices by providing useful and reliable information on the relative performance of each office, and to facilitate this process by developing a common process and methodology for benchmarking. The group should also implement a 'code of conduct', establishing appropriate benchmarking protocols that define expected behaviours and outcomes towards benchmarking partners.

In general, we believe that reperformance of the benchmarking may be most appropriate within a timeframe of one year. Later on, the period between two benchmarking activities may be expanded to a two years timeframe, depending on the needs of the participating office.

We would further recommend to keep the basic core of the benchmarking (i.e. productivity measurement based on P1, P2 and P3) stable, thereby allowing also a view on the productivity development in each office period over period. Besides this, a lot of flexibility can and should be used to modify or add performance indicators, or include new topics based on the experience and knowledge gained before. For example, it may be worth considering adoption of the 'partial efforts' methodology for the benchmarking to achieve further, more detailed results regarding productivity of individual products.

Following is a list of key factors that, in our experience, have helped insure bottom-line success in benchmarking projects:

- Senior management unqualifiedly supports the project.
- Scope of the benchmarking effort is clearly defined.
- Objectives are well defined.
- Clear foundation and common understanding of data in the areas to be benchmarked.
- Communication is broad, regular and frequent with all stakeholders.

Appendix A Glossary

Combined Search & Examination	Also referred to as CS&E. The applicant does not request search and examination separately. At the UKIPO, the applicant receives the search report together with the first communication. At the DPMA, a search report is generated internally, but not sent to the applicant; the applicant receives the first communication right away.
Communication	If referred to in data definition / data analysis: any written communication to the application raising objections against the application. Neither search reports or written opinions nor the final notification about the decision are to be considered as communication. Telephone interviews are to be considered as communications, if and only if they include sending a written document to the applicant stating the results from the telephone call. For the purpose of this study the sequence 'call → telephone note → letter to applicant summarizing the call' should be counted as one communication.
Doublure Searches	A Doublure search is a supplementary search performed for an application which was initially filed in one of the countries, for which the EPO performs searches, and already has been searched by an EPO examiner, before the applicant decided to apply for an EP patent with the EPO.
EuroPCT bis SR	A supplementary search, performed for incoming PCT applications entering the regional phase, is referred to as EuroPCT bis search. The initial search (PCT Chapter I) was performed at the International Search Authority; there the application was initially filed, and an International Search Report was produced.
Examination	(*see definition for Patent Granting Process*)
Patent Granting Process	The patent granting process as considered in this study is separated into two distinct stages: • **Search stage** (also referred to as 'search' only): The search stage starts with the applicant filing a request for search, which is not necessarily equal to filing an application. Applications may be filed without fees for processing being paid, so that the application is considered to be withdrawn. In addition applications may be filed in order to be awarded a priority date with the application later being filed at another patent office. The search stage ends – for the purpose of this study – with delivering the search report to the applicant. • **Examination stage** (also referred to as 'examination' only): The examination stage starts with the applicant filing a request for examination (if combined search & examination does not apply) of with the examiner finishing the search report and starting to draft the first communication raising objections (if combined search & examination does apply). The examination stage ends with the notification of grant / refusal being sent to the applicant or with the application being considered as withdrawn (when the

	applicant does not reply to communications within the defined time limit) or with the application being explicitly withdrawn by the application.
Search	(*see definition for Patent Granting Process*)

Appendix B Productivity Measurement Definitions

The indicators of the P1-P3 indicator set are basically defined as:

productivity = capacity in days / amount of items produced

The result of this method is basically information about the time spent (in days) for one unit of production, such as 'time per final action (P1)', 'time per product (search report + final examination) (P2)' and 'time per communication (P3)'. For this reason, the indicator set was defined as 'time per action'.

For both numerator and denominator (at all levels, P1 through P3) definitions / measurement elements are in place at all three offices. They, however, need to be aligned in order to allow for a true comparison. Regarding the definition of capacity, this requires analyzing the type of work included in the respective definitions and explicitly formulating the adjustments, which need to be made in order to have a homogeneous definition (see section B.1).

Regarding the definition of the denominator, the alignment requires defining distinct containers for the products and carefully allocating the products to these containers (see section B.2).

In general, the time period used for measuring capacity and production

B.1 Capacity Definition

Based on the capacity definitions existing at each of the three offices, different kinds of work can be identified as laid down below. The respective capacity definitions exclude a similar set of activities and include similar types. Adjustments have to be made for the DPMA definition only.

	EPO: 'S&E Time'	**UKIPO: 'Time spent for patent processing'**	**DPMA: 'Nettoarbeitstage'**[1)]
The respective capacity definition does not include:	Classification	Classification	Classification / Allocation
			Eingangsprüfung
	Training and being trained	Training and being trained	Training and being trained
	Coaching	Coaching and being coached[2)]	
	Recruiting	Recruiting	Recruiting
	Project Work	Project Work	Project Work
	Absence	Absence	Absence
	Staff Representation	Facilities Time	
		Marketing & Innovation	
		SAS / Security products	
		'*Opposition*' (post grant)	
		Opinions (post grant)	Serving as IT Key User
	Search & Examination	Search & Examination	Search & Examination

The respective capacity definition does include	Work	Work	Work
	Opposition Work	n/a[3)]	Opposition Work
	Being Coached		Coaching and being coached
		Administrative functions (manage headings)	
			'Prüfstoffpflege'[*)]
			Utility Models[*)]
			Verfahrenskostenhilfe[*)]
			Schiedsverfahren[*)]
			Beisitzertätigkeit
			Supplementary Protection Certificate[*)]
			Beschwerden
			**) items were manually taken out of the capacity definition*[4)]

Notes:

1) The DPMA data source ('Prüferstatistik') is based on individual product records, prepared by examiners in office for more than 18 months. This has the following implications:

   - The capacity definition of the other patent offices should exclude newcomers with less than 18 months of service for the respective patent office. This is implicitly done for UKIPO data, as there are no newcomers (last hiring in September 2004). For the EPO, the generation of data was restricted to the non-newcomers.

   - The DPMA is awarding production of a newcomer to the examiner who is coaching the newcomer. Hence, production of newcomers is included, while the capacity is not included. This is justified by the fact, that the production of an examiner serving as coach is equal to the production of an examiner not coaching a newcomer. Due to the fact, that this production cannot be taken out from the calculation, and due to the aforementioned justification this approach was applied to EPO data, too. UKIPO data once again was not affected, as there were no newcomers.

2) UKIPO does not count being coached in this capacity definition. Due to the fact, that the last hiring took place in September 2004, the distortion is very likely to be negligible.

3) UKIPO does not have opposition work included in the capacity definition; this is accounted for by not counting opposition-type post grant work in the product definitions.

4) The items designated as requiring manual adjustment are taken out of the DPMA capacity definition by deducting the time records (from the T.I.M. system) for the respective activities from the S&E capacity as defined in the 'Prüferstatistik'.

B.2 Definition of production

Similar products and similar product structures are in place at all three offices. Based on the common elements of the patent granting process (search → communications in the examination stage → final action at the end of the examination stage), the containers are defined as laid down below:

The respective products are allocated to be either a final action, which in general closes the processing of an application, a search, which in general produces a designated search report not necessarily being distributed to the applicant, or a communication, which in general is written or oral (e.g. oral proceedings) interaction with an applicant, where objections are raised.

	EPO	UKIPO	DPMA
Final actions (for P1, P2, P3)	Grant – EP / E-PCT	Grant	Erteilung (=*grant*)
	Refusal – EP / E-PCT	Refusal	Zurückweisung (=*refusal*)
	Withdrawal	Withdrawal	Zurücknahme (=*withdrawal*)
	IPER – PCT Chapter 2[1)]		
	Opposition		Einspruchsbearbeitung
Searches (for P2, P3)	European SR – EP	Search Report w/ WO Search Report w/o WO	Recherchebericht (§ 43 PatG)
	ISR – PCT Chapter 1		Recherchebericht (§ 7 GebrMG)[2)]
	EuroPCT bis SR	Search Report from CS&E[3)]	Recherchebericht (§ 44 PatG)[4)]
	National SR[5)]		'Sonstige Recherchen'
	Doublures SR		
Communications (for P3)	First Action – EP	Examination Report	Erstbescheid
	Further Action – EP	Amendments	Erwiderungsbescheid
	Telephone Interviews	Telephone Notes	
	Oral Proceedings	Hearing Report	Anhörung

Notes:

1) Although the IPER (International Preliminary Examination Report, according to PCT Chapter II, also referred to as IPRP – International Preliminary Report on Patentability) is a non-binding report generated by the EPO, the procedure up to the report is equal to the 'common' grant process (i.e. communications are issued leading to replies from applicants, etc.). For that reason, the PCT applications are treated equally to Euro Direct applications with the IPER being considered as final action and the related communications being considered as first / further actions.

2) The utility models processes are to be excluded from this study. Search reports for utility models, however, are equal to search reports for patents both in terms of effort and processing as well as procedures. Therefore, adjusting the capacity definition based on T.I.M. data would be possible, but – due to taking data from a different data set – would cause greater distortion than counting these search reports as 'normal' search reports. For that reason, this data remained in the data set used for this analysis.

3) For applications being processed by combined search & examination at UKIPO, a search is performed equally to searches for applications being subject to two distinct process stages, but not counted separately. In order to be able to account for this, one search report is counted for each CS&E performed.

4) For applications being processed by combined search & examination at UKIPO and DPMA, a search is performed equally to searches for applications being subject to two distinct process stages. Although an explicit search report is not issued by the DPMA, the search being performed is counted.

5) The EPO carries out searches for various national offices (e.g. French Patent Office). As there are no differences in processing, these are accounted for as 'normal' search reports.

B.3 Sensitivity Analysis

The model for sensitivity analysis addresses the assumption that the number of searches and the number of examinations are compounded to a number of 'complete files' (please note, that this still captures the information of different search/examination ratios) using different weightings for search and examination.

The weightings range from allocating 65% of the time spent for a complete file to search with 35% remaining at examination on the one side to allocating 50% to both stages. The former structure is currently implemented in the EPO's internal measurement framework; the latter structure can be supported by examiner interviews, who state that in general search is more time-consuming than examination, but in cases, where several communications and oral proceedings are required, time efforts may be distributed equally.

This sensitivity analysis gives the following results:

Indicator	**EPO** [days]	[%]	**DPMA** [days]	[%]	**UKIPO** [days]	[%]
Complete File (Search: 65% / Exam.: 35%)	2,97	137%	2,20	102%	2,17	100%
Complete File (Search: 60% / Exam.: 40%)	3,05	139%	2,24	102%	2,20	100%
Complete File (Search: 50% / Exam.: 50%)	3,21	142%	2,31	103%	2,25	100%

The results for this slightly different definition of P2 show that the EPO is +37 to +42% relatively to UKIPO and DPMA is +2% relatively to EPO for three different sets of assumptions. This confirms that P2 and P3 should be in the focus of the analysis (see section 6.2).

Please note, that applying 50%/50% does not generate the same results as the P2 calculation above due to the fact, that the complete file analysis is adjusted for oppositions. The rationale for this adjustment is as follows:

The effort for one opposition case is estimated to be 10 man days at the EPO and 6,25 man days at the DPMA, according to interviewees and data-related discussions (UKIPO treats oppositions differently). If there is an assumption relating to an estimate of the relative weight of search and examination, a weighting has to be assigned to oppositions, too. This, however, would require assigning different weightings for different patent offices leading to an inconsistent structure of assumptions. For that reason the oppositions are taken out of both capacity and production for the purpose of this sensitivity analysis.

Appendix C KPI Definitions

C.1 Deriving performance indicators from productivity drivers

The analysis of productivity differences is done using performance indicators, which intend to measure performance drivers which influence the actual productivity. The following table shows the indicators (referred to as '(K)PI' in the following table) defined for each productivity driver (referred to as 'Productivity Driver' in the following table). Each of the productivity drivers can be classified into one of the major productivity drivers (referred to as 'Headline Productivity Drivers' in the following table).

ID	Headline Productivity Driver	ID	Productivity Driver	(K)PI
B.1	Examiners have appropriate level of competence and experience.	**1**	Experience of patent examiners	Experience of patent examiners
B.1	Examiners have appropriate level of competence and experience.	**2**	Adequately training staff will improve productivity.	Share of individual capacity spent for training and being trained as well as for coaching and being coached
B.1	Examiners have appropriate level of competence and experience.	**3a**	Adequately training staff will improve productivity.	Amount of induction / early career training – classroom
B.1	Examiners have appropriate level of competence and experience.	**3b**	Adequately training staff will improve productivity.	Amount of induction / early career training – tutor days
B.1	Examiners have appropriate level of competence and experience.	**3c**	Adequately training staff will improve productivity.	Amount of induction / early career training – length
B.2	Examiners are provided an appropriate work environment.	**4a**	Staff satisfaction and motivation	Sickness days
B.2	Examiners are provided an appropriate work environment.	**4b**	Staff satisfaction and motivation	Sickness days (long-term)
B.2	Examiners are provided an appropriate work environment.	**4c**	Staff satisfaction and motivation	Sickness days ex long-term
B.2	Examiners are provided an appropriate work environment.	**5**	Quality of support provided by IT applications (software)	Availability of IT applications (software) / databases used for search
B.3	Examiners do focus on search & examination	**6**	Time available for S&E	Capacity available for S&E
A.1	Non value adding process steps are eliminated.	**7**	Allocation of application to adequate examiner	Adequacy of initial allocation
A.3	Quality requires effort.	**8**	Type of applications / strategic behavior of applicants	% of direct grants
A.1	Non value adding process steps are eliminated.	**9a**	'Good' early communication may shorten the process.	Communications per grant
A.1	Non value adding process steps are eliminated.	**9b**	'Good' early communication may shorten the process.	Communications per refusal
A.1	Non value adding process steps are eliminated.	**9c**	'Good' early communication may shorten the process.	Communications per withdrawal

C.2	Complexity of examined matter will reduce productivity.	**10**	Complex applications may slow down the process.	Claims per application
B.2	Examiners are provided an appropriate work environment.	11	Inequal distribution of subject matters may require single examiners to cover a broad technical field slowing down processing.	Gini coefficient for assigning IPC's
C.1	Applicant behaviour may prevent high productivity.	**12**	Low quality of patent applications filed (in particular when filed w/o support) require increased effort for properly addressing the invention.	Share of private applicants
A.2	Up front effort / quality may shorten the process.	**13a**	'Devastating' first communication may make the applicant quit.	Share of withdrawals after first communication
A.2	Up front effort / quality may shorten the process.	**13b**	'Good' SR may make the applicant quit.	Share of withdrawals after Search Report w/ WO
A.2	Up front effort / quality may shorten the process.	**13c**	'Good' SR may make the applicant quit.	Share of withdrawals after Search Report w/o WO
A.2	Up front effort / quality may shorten the process.	**13d**	SR before exam. may make the applicant quit, increasing efficiency of whole process.	Share of searches delivered with written opinion
A.1	Non value adding process steps are eliminated.	**14a**	Direct discussion speeds up process	Oral proceedings per grant
A.1	Non value adding process steps are eliminated.	**14b**	Direct discussion speeds up process, in particular when refused later on.	Oral proceedings per refusal
A.1	Non value adding process steps are eliminated.	**14c**	Direct discussion speeds up process	Oral proceedings per withdraw.
A.1	Non value adding process steps are eliminated.	**14d**	Direct discussion speeds up process	Oral proceedings per final action
C.2	Complexity of examined matter will reduce productivity.	**15**	Applications not translated before filing are supposed to be of higher quality.	Share of applications from applicants filed in their mother tongue
B.1	Examiners have appropriate level of competence and experience.	**16**	Mother tongue = language of application and procedures eases writing of communications and understanding of claims.	Probability of being examined by native speaker
A.3	Quality requires effort.	**17**	Low grant ratio may indicate that examination is carried out thoroughly requiring increased time effort.	Ratio of granted patents

C.2 Detailed methodical definitions

Each identified indicator is put into concrete terms by providing a detailed methodical definition, which in turn serves as foundation for the individual technical definition (specifying data source, etc., based on each office's data applications).

ID	(K)PI	Methodical Definition
1	**Experience of patent examiners**	% of patent examiners serving for three or more years
2	**Share of individual capacity spent for training and being trained as well as for coaching and being coached**	% of total time for training others as well as receiving training and coaching as well as being coached for non-newcomers (more than 18 months in office)
3a	**Amount of induction / early career training – classroom**	Days of training received (classroom), assigned to newcomers (by policy, if applicable) in total regardless of time already serving in office
3b	**Amount of induction / early career training - tutor days**	Days of training received (tutor days = days receiving one-on-one coaching), assigned to newcomers (by policy, if applicable) in total regardless of time already serving in office
3c	**Amount of induction / early career training - length**	Time period in months, over which the newcomer training [Def.: Training and one-on-one coaching received only at the beginning of the service in the office] is distributed
4a	**Sickness days**	# days off due to sickness (total) / # patent examiners
4b	**Sickness days (long-term)**	# days off due to sickness (long-term > 200 d p.a.) / # patent examiners
4c	**Sickness days ex long-term**	(# days off due to sickness - # days off due to sickness (long-term > 200 d p.a.)) / # patent examiners
5	**Availabilty of IT applications (software) / databases used for search**	1 - % of downtime during business hours as reported in service level reporting
6	**Capacity available for S&E**	Capacity for S&E (as defined for the productivity analysis) / total (theoretically) available time (considering that part-time workers cannot contribute full-time) [both for examiners in office > 18 months]
7	**Adequacy of initial allocation**	1 - % of patent application that have to be re-distributed during the process to a different department (EPO: Directorate; UKIPO: Group; DPMA: ?)
8	**% of direct grants**	# direct grants / # grants direct grants = patents granted w/o one communication stating objections (search report does not count).
9a	**Communications per grant**	# communications / # final actions for grants communication = written communication to applicant raising objections (i.e. no search reports, no invitation to pay fees etc.) final notification of decision is excluded
9b	**Communications per refusal**	# communications / # final actions for refusals based on reasoning and refusals on request for decision according to the state of the file
9c	**Communications per withdrawal**	# communications / # final actions for withdrawals
10	**Claims per application**	# of independent and dependent claims per application

11	**Gini coefficient for assigning IPC's**	Stratify the examiners along the number of IPC subclasses they are assigned to: 1 / 2 / 3 / more than 3 Def.: IPC level is subclass (3rd level = four digits/letters, e.g. A01B)
12	**Share of private applicants**	# of applications in the examination stage having been filed by private applicants (being defined as those neither supported by attorneys nor being a corporation or educational / research institution) / # applications in the examination stage
13a	**Share of withdrawals after first communication**	# of applications withdrawn with the first communication having been issued, but no further communication / # of applications withdrawn with a request for application having been submitted First communication: - search report (w/ or w/o WO) is not considered as comm. - communication raises objections
13b	**Share of withdrawals after Search Report w/ WO**	# of applications withdrawn with SR **w/** WO having been issued without any further communication / # of applications withdrawn (including withdrawals after search and withdrawals at the examination stage)
13c	**Share of withdrawals after Search Report w/o WO**	# of applications withdrawn with SR **w/o** WO having been issued without any further communication / # of applications withdrawn (including withdrawals after search and withdrawals at the examination stage)
13d	**Share of searches delivered with written opinion**	# searches w/ WO / (# searches w/ WO + # searches w/o WO)
14a	**Oral proceedings per grant**	# of oral proceedings in cases that are eventually granted / # grants
14b	**Oral proceedings per refusal**	# of oral proceedings in cases that are eventually refused / # refusal
14c	**Oral proceedings per withdraw.**	# of oral proceedings in cases that are eventually withdrawn / # withdrawal
14d	**Oral proceedings per final action**	# of oral proceedings / # final actions
15	**Share of applications from applicants filed in their mother tongue**	# applications, for which the procedural language is also the mother tongue of the applicants country / # applications
16	**Probability of being examined by native speaker**	% of examiners whose mother tongue is one of the procedural languages
17	**Ratio of decision to grant for applications in examination stage**	# applications that were granted during the reporting period / # final actions

C.3 Technical notes and comments for KPI results

#3: Amount of newcomer training	The DPMA puts emphasis on one-to-one coaching of new examiners, while EPO and UKIPO put more weight on classroom trainings. This is considered to be a strength by examiners at the DPMA.

#4: Sickness days	There is a different setting at UKIPO, as examiners do not have 'government official' status, which the examiners at EPO and DPMA have, who therefore cannot be dismissed by the respective office. This indicator is taken into this study as a proxy for measuring overall staff motivation / satisfaction.
#6: Capacity available	The time spent outside S&E is in general considered as an incentive (as opposed to the perceived 'monotony' of pure S&E work). According to our interviewees eventual effects from 'mental tooling time' / 'mental set-up time' because of the interruption of work are negligible.
#7: Adequacy of initial allocation	The reallocations at the EPO also include organizational reallocations occurring e.g. for work balancing within one joint cluster; these, however, create the additional effort (productivity loss) for reallocation as well. If organizational reallocations are not considered, the value for EPO is 93%. The quality of allocation at the DPMA comes from utilizing examiners in the process from the beginning (as currently done in the daily 'Börse', where representatives from each department get together for allocating incoming files among the departments).
#8: Share of direct grants	The high value for the EPO may result from the role of the national offices as 'filter', i.e. taking out bad applications from the IP process, leaving a higher percentage of 'good' applications, which are eventually filed at the EPO. In addition, due to the lower share of private applicants, the EPO is likely to receive more corporate applications, which are more soundly prepared and reviewed before filing. The DPMA value cannot be extracted from existing data sources, therefore the value presented provides an estimate within a range (minimum: number of direct grants, if no oppositions are related to direct grants; maximum: number of direct grants, if all oppositions are related to direct grants).
#9a: Communications per grant	The lower value for the EPO is likely to be caused by the high share of direct grants.
#9b: Communications per refusal / per termination	The legal framework for the UKIPO requires the applicant to 'have the application in order 4,5 years after date of priority', which is likely to have an impact on the cycle time for terminations.
#10: Number of claims	The number of claims has limited value only, as it was technically not possible to distinguish between independent and dependent claims. In addition, most of the interviewees are of the opinion, that even if independent claims are counted, there are cases of difficult one-claim applications with the claim spanning over 1,5 pages of text. The EPO measures the current number of claims, while UKIPO and DPMA measure the number of claims at the time of filing the

	application.
#12: Share of private applicants	This indicator seems to confirm the hypothesis that national patent offices serve as 'filter' for the EPO. According to UKIPO and DPMA examiners, experience shows that more communications are required for private applicants. Both UKIPO and DPMA measure the ratio at the examination stage; for the EPO the ratio is available at filing stage only. This issue should be negligible, as the UKIPO experience shows that the share of private applicant is decreasing from stage to stage (the ratio is 24.6% for applications filed and 11.6% for applications searched). Accordingly the share of private applicants at the examination stage can be expected to below the share at the point of filing.
#13a: Withdrawals after first communication	The denominator is 'all withdrawals in the examination stage' for KPI #13a, and 'all withdrawals in the search and the examination stage' for KPI #13b and #13c. Alternatively the denominator for #13b could be used for #13a, too. This would eventually provide for creating a setting, where 100% of withdrawals in the search and the examination phase can be split up into (#13b,c)% withdrawn after search, (#13a)% withdrawn after the first examination report and (1 - #13a - #13b, c)% withdrawn after the second examination report or later. As KPI #13a using the former definition allows for a better focus on the examination stage of the process, this definition was implemented.
#13b: Withdrawals after Search Report w/ WO	The DPMA does not issue written opinions accompanying search reports. For that reason, the respective KPI value is 'n/a'.
#13c: Withdrawals after Search Report w/o WO	The difference between EPO and UKIPO comes from the facts that (a) the majority of UKIPO search report are issued without written opinion, while the opposite is true for the EPO and (b) the indicator is not defined as number of withdrawals vs. number of cases but as number of withdrawals for one scenario vs. number of withdrawals for all scenarios. This leads to the situation that the majority of UKIPO withdrawals will occur after search report w/o written opinion, while only a few EPO withdrawals will occur in this scenario.
#14b: Oral proceedings per refusal	The high amount for the EPO has a significant impact on productivity because of the legal requirement to have three EPO examiners participate in oral proceedings. Computing a total number of oral proceedings per final actions, however, shows that oral proceedings occur at 6,0% of the cases at both the DPMA and the EPO.
#15: Share of applications from applicants filed in their mother tongue	Including this indicator rests on the assumption, that translations from the mother tongue of the inventor into a procedural language causes a drop in quality of the description and the claims, which in turn may negatively impact productivity. This

	was confirmed by patent examiners at all three patent offices.
#16: Probability of being examined by native speaker	According to feedback from the interviewees at EPO and DPMA, it is very difficult to really understand the applications, if the claims are not available in one's mother tongue. The KPI calculated for EPO, however, is a boundary value and will hold, if and only if e.g. only German examiners examine German applications, etc.; as this is very unlikely, the actual percentage for examinations being examined by native speakers will be lower.

Appendix D Interview guideline

The interview guideline includes the following questions. Please note, that this guideline served as such as well as a template for documenting the interviews. If necessary / appropriate, the interviewers added or omitted questions.

B. General Information

1. Name, Department, Description of subject matter

2. What other special duties (time deductible Box Investments, 'Sonderfunktionstage', etc.), not directly related to search & examinations (e.g. projects), do you have to complete?

3. How much time do you spend on these special duties?

4. To what extent do you personally benefit from these duties?

5. What other administrative activities not directly related to search & examinations do you have to complete?

6. How much time do you spend on these administrative activities?

C. Management Processes

7. Which ((key) performance) indicator or else is the primary information used in fact by your superior to evaluate your individual performance?

8. How are incoming applications allocated to you / other examiners within your department (push procedure / pull procedure / meeting-based allocation)?

D. Core Processes

9. Do you use self-made tools or deploy individual practices for maintaining / storing / managing the 'documentation used for the examination of inventions' ('Prüfstoff')?

10. Do you use self-made tools or deploy individual practices for searching and examination activities in terms of e.g. self-made spreadsheet tools?

11. What tools do you use / which procedures do you deploy, when you have to perform updates to prior searches during the course of the examination process?

12. Assuming that the total amount of a patent examiner's working time needed for processing a patent application from filing to the eventual grant or refusal comprises 100%, what share of time do you use for the search stage and examination stage, respectively (in particular when considering your subject matter)?

13. Which means of communication are suited best in the examination phase for communicating with applicants? Which means of communication would you prefer, assuming that you are not bound to internal guidelines that require different means of communication?

14. To what extent can / does combined search & examination improve / ease the work of patent examiners?

15. Considering that an application needs to be reviewed for novelty (Neuheit), inventive step (erfinderische Tätigkeit) and industrial applicability (gewerbliche Anwendbarkeit), which of these elements is / should be the most important one and does require the most efforts?

E. Support processes

E.1 Evaluation of IT support

16. To what extent do the applications provided for search & examination cover your needs and expectations?

17. To what extent do the applications provided for internally documenting search and examination results and communicating these to applicants cover your needs and expectations?

E.2 Training and Coaching

18. How do you experience the possibility, extent and scope of training on matters of search & examination provided for by your respective patent office? Is your specific need covered by the actual training on matters of search & examination performed?

19. Is there a systematic training scheduling / approach (e.g. curriculum) for training on matters of search & examination?

20. How important do you consider the necessity of visiting external events (such as trade fairs, conferences) to be?

21. How do you experience the possibility to take care of newcomers (e.g. coaching on search & examination work) from the point of view of a coach?

E.3 Non-patent literature

22. Please estimate the relative importance of patent and non-patent literature?

23. If you are responsible for maintaining your set of non-patent literature, how much time do you spend on average per week on it?

24. Considering your subject matter, would it make sense / be possible to aim at synergies with other examiners at your or other patent offices?

F. Problems & Restrictions

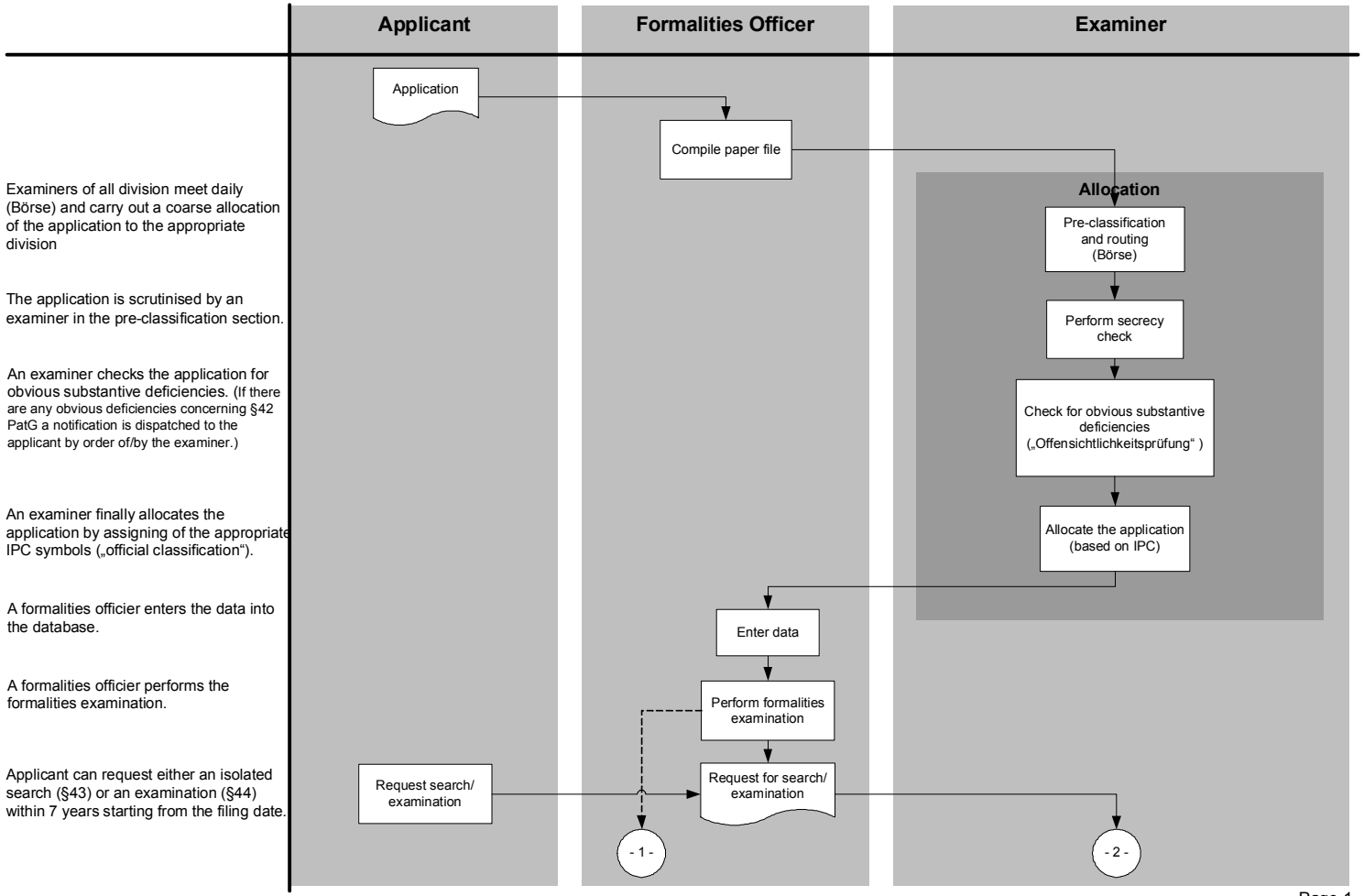
25. Which problems and restrictions do you experience in your daily work coming from defined processes and supporting information technology?

26. Which problems and restrictions do you experience in your daily work coming from legislation and regulation?

Appendix E Process Documentation

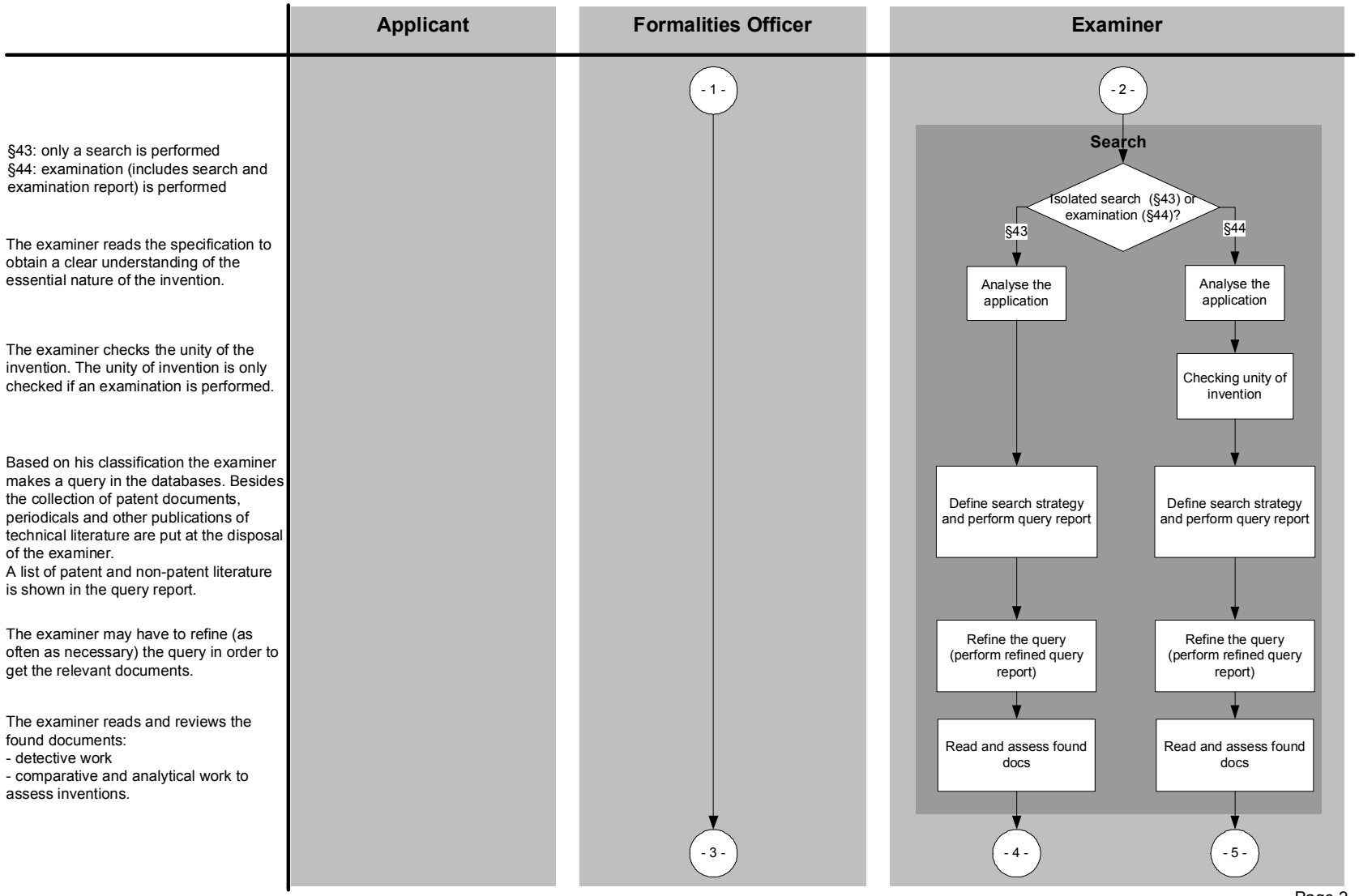
DPMA - office-specific process flowchart

DPMA: Generic Patent Granting Process



Page 1

DPMA: Generic Patent Granting Process



§43: only a search is performed
§44: examination (includes search and examination report) is performed

The examiner reads the specification to obtain a clear understanding of the essential nature of the invention.

The examiner checks the unity of the invention. The unity of invention is only checked if an examination is performed.

Based on his classification the examiner makes a query in the databases. Besides the collection of patent documents, periodicals and other publications of technical literature are put at the disposal of the examiner.
A list of patent and non-patent literature is shown in the query report.

The examiner may have to refine (as often as necessary) the query in order to get the relevant documents.

The examiner reads and reviews the found documents:
- detective work
- comparative and analytical work to assess inventions.

DPMA: Generic Patent Granting Process

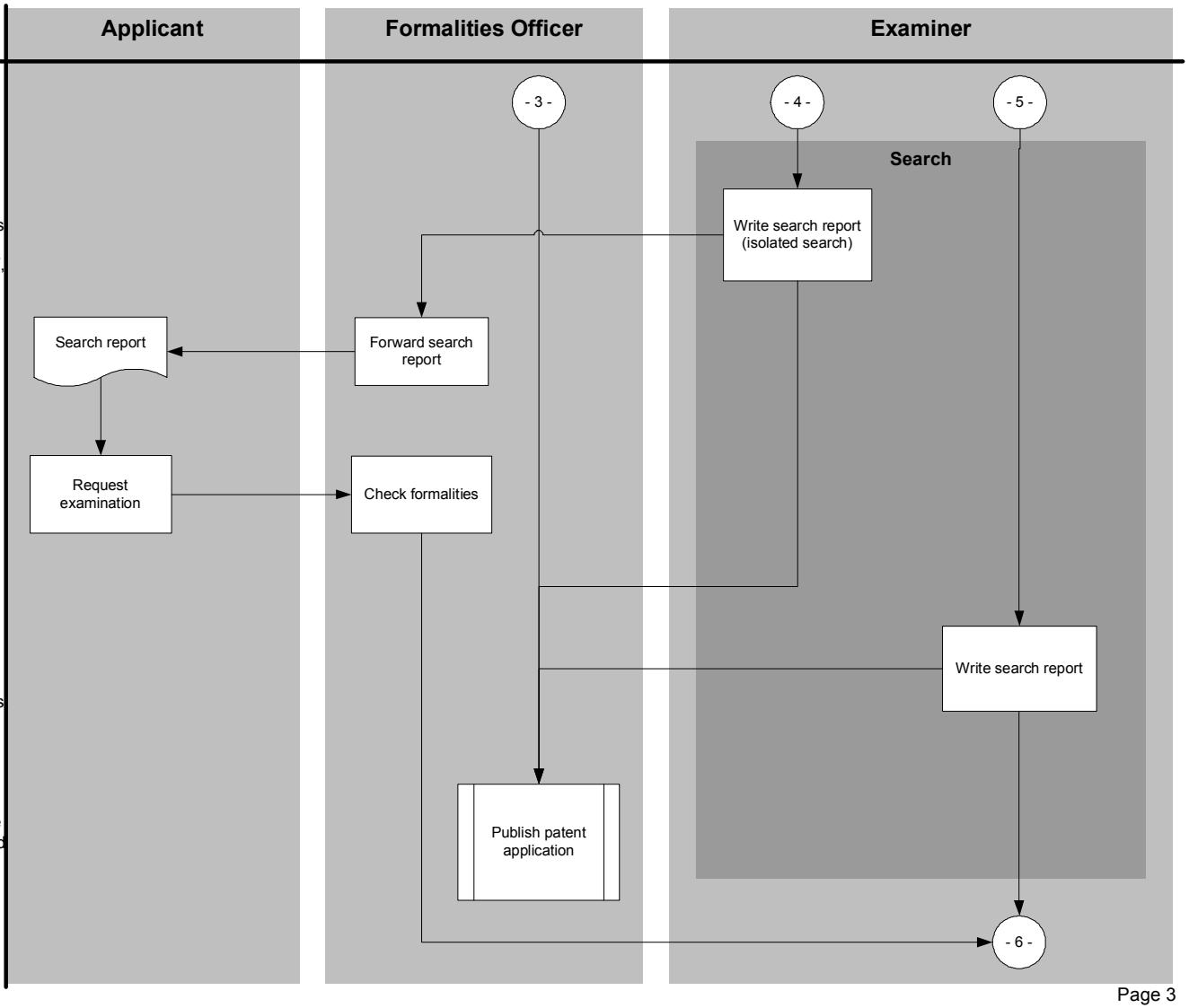
§43: The examiner selects from the documents retrieved the ones to be cited in the report and prepares the search report with reference to the specific claims. All documents cited in the search report are categorised by a particular letter (X, Y, A, etc.)

The search report is transmitted to the applicant with copies of any cited docs.

A request for examination can be filed by the applicant within 7 years starting from the application date. In order that examination can begin, the applicant is required to pay the examination fee. Prior to the first communication from the examiner, the applicant may file comments on the search report and/or amendments to description, claims, drawings.

§44: The examiner selects from the documents retrieved the ones to be cited in the report and prepares the search report with reference to the specific claims.

If the search report is not available in time for publication, the application is published without search report.



Page 3

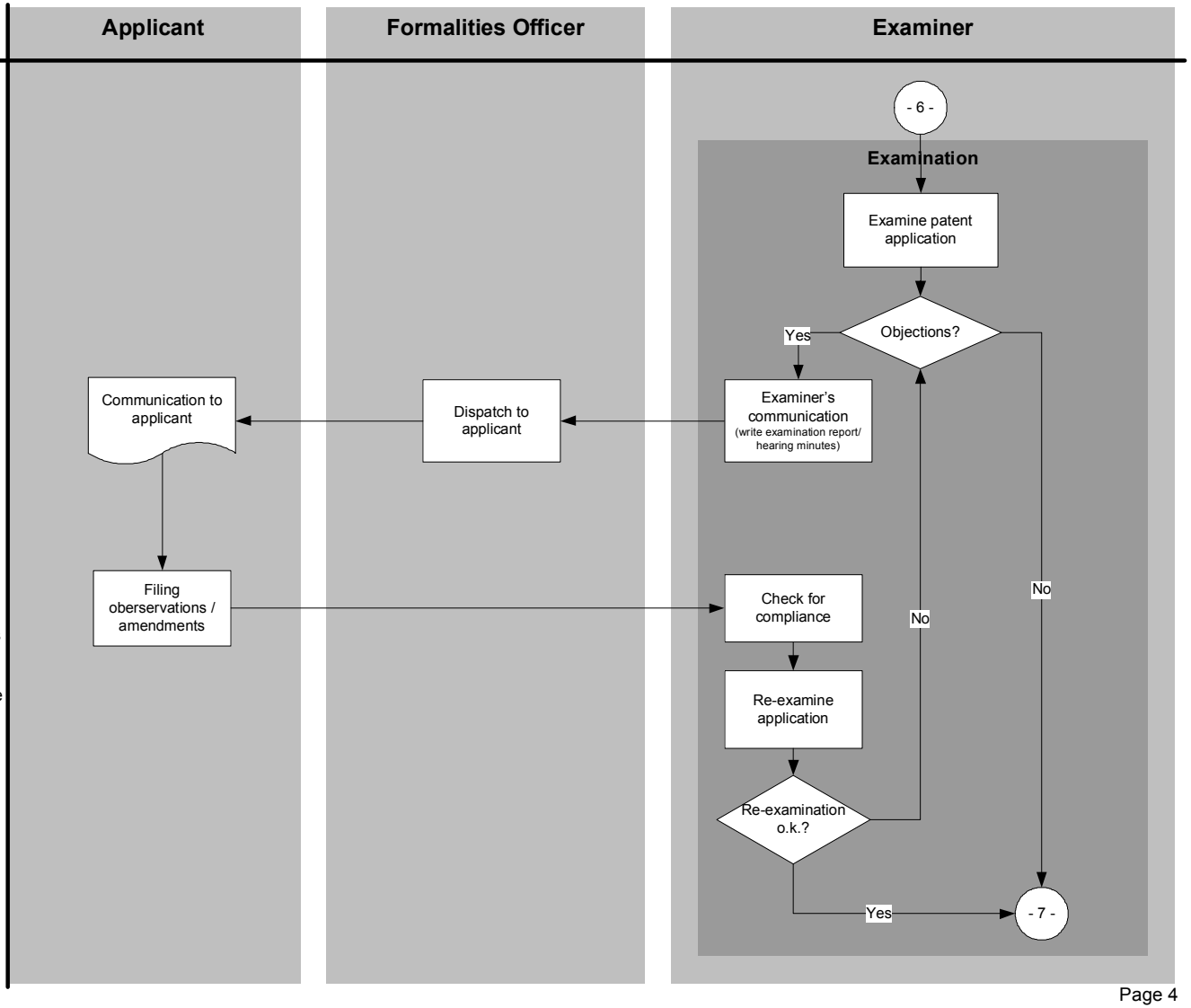
DPMA: Generic Patent Granting Process

The examiner's first step is to study the claims of the application, concentrating on any amendments and/or comments filed by the applicant in response to the search report.

If the examination reveals that the application or the invention to which it relates does not meet the requirements of the PatG, the examiner writes a report stating his objections and invites the applicant to file amendments rectifying the deficiencies, or observations. (Further communications: The examiner writes the minutes if a hearing is hold)

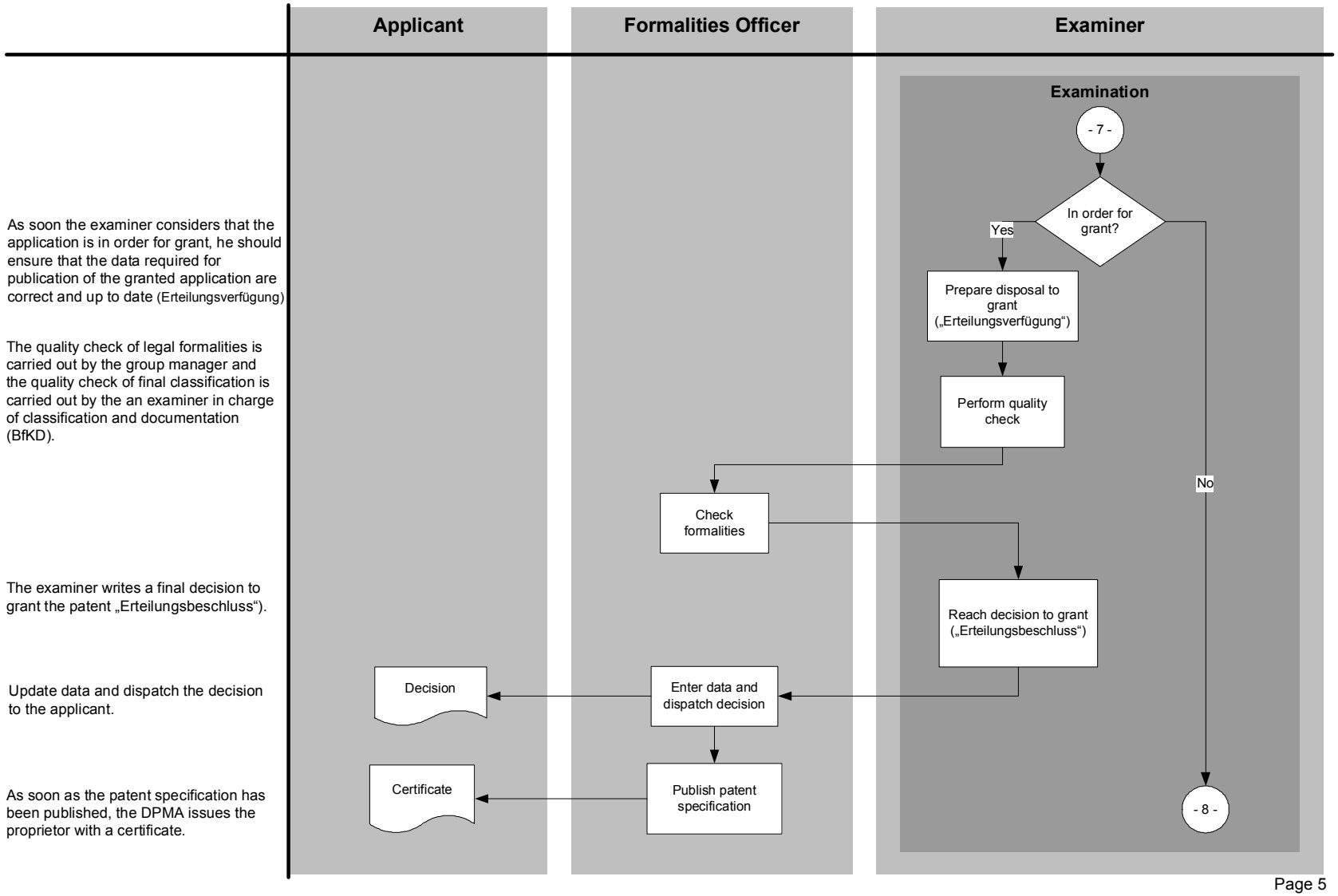
Following the applicant's reply to the first communication, the examiner must re-examine the application taking into account the observations or amendments (new claims) made by the applicant.

If the re-examination shows that there are still objections to be met, the examiner must consider whether they can best be resolved by a further written communication, telephone discussion or a hearing.



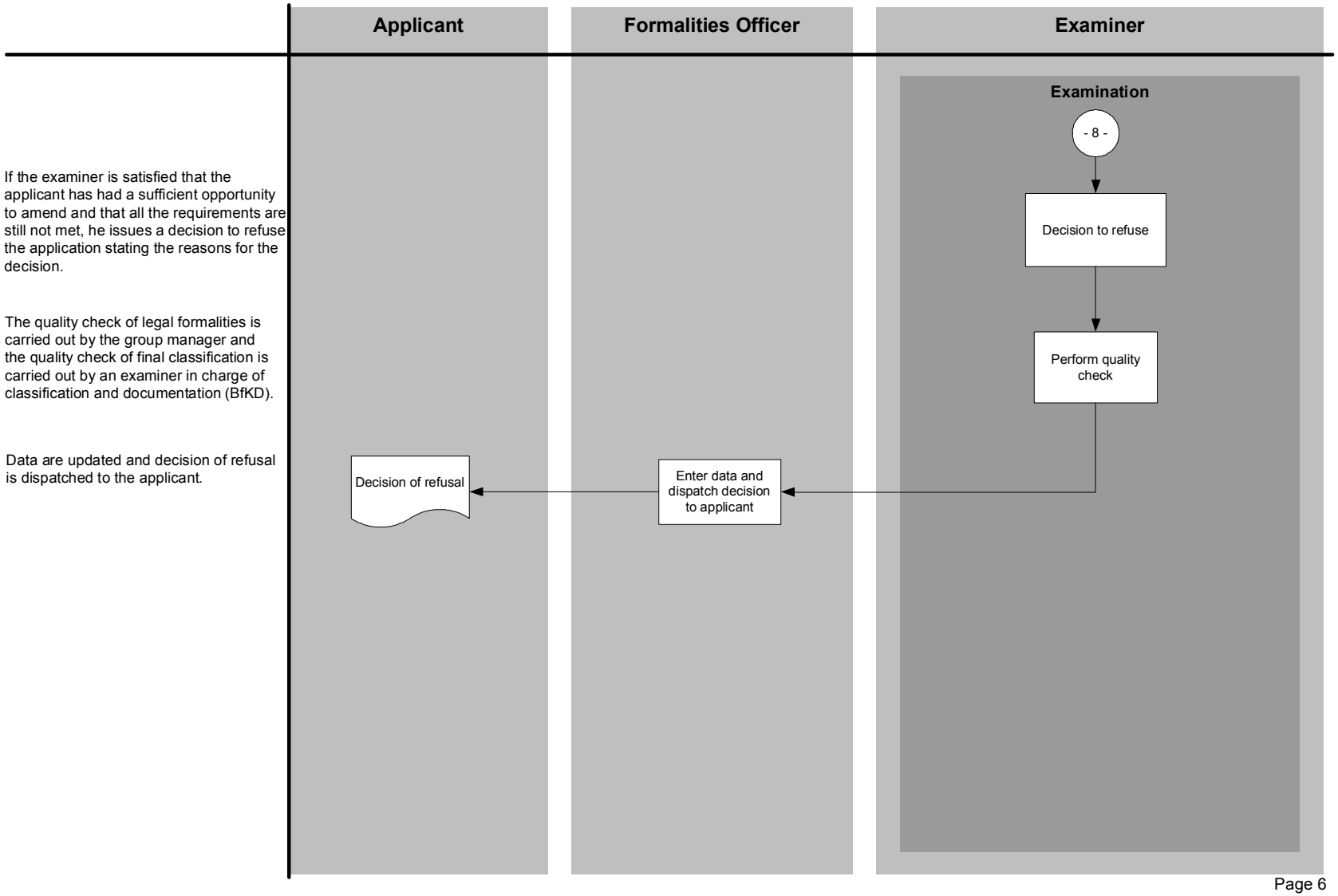
Page 4

DPMA: Generic Patent Granting Process



Page 5

DPMA: Generic Patent Granting Process



If the examiner is satisfied that the applicant has had a sufficient opportunity to amend and that all the requirements are still not met, he issues a decision to refuse the application stating the reasons for the decision.

The quality check of legal formalities is carried out by the group manager and the quality check of final classification is carried out by an examiner in charge of classification and documentation (BfKD).

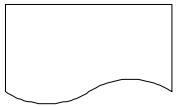
Data are updated and decision of refusal is dispatched to the applicant.

Page 6

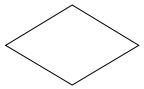
Key:

Action

Side-Process



Correspondence with applicant

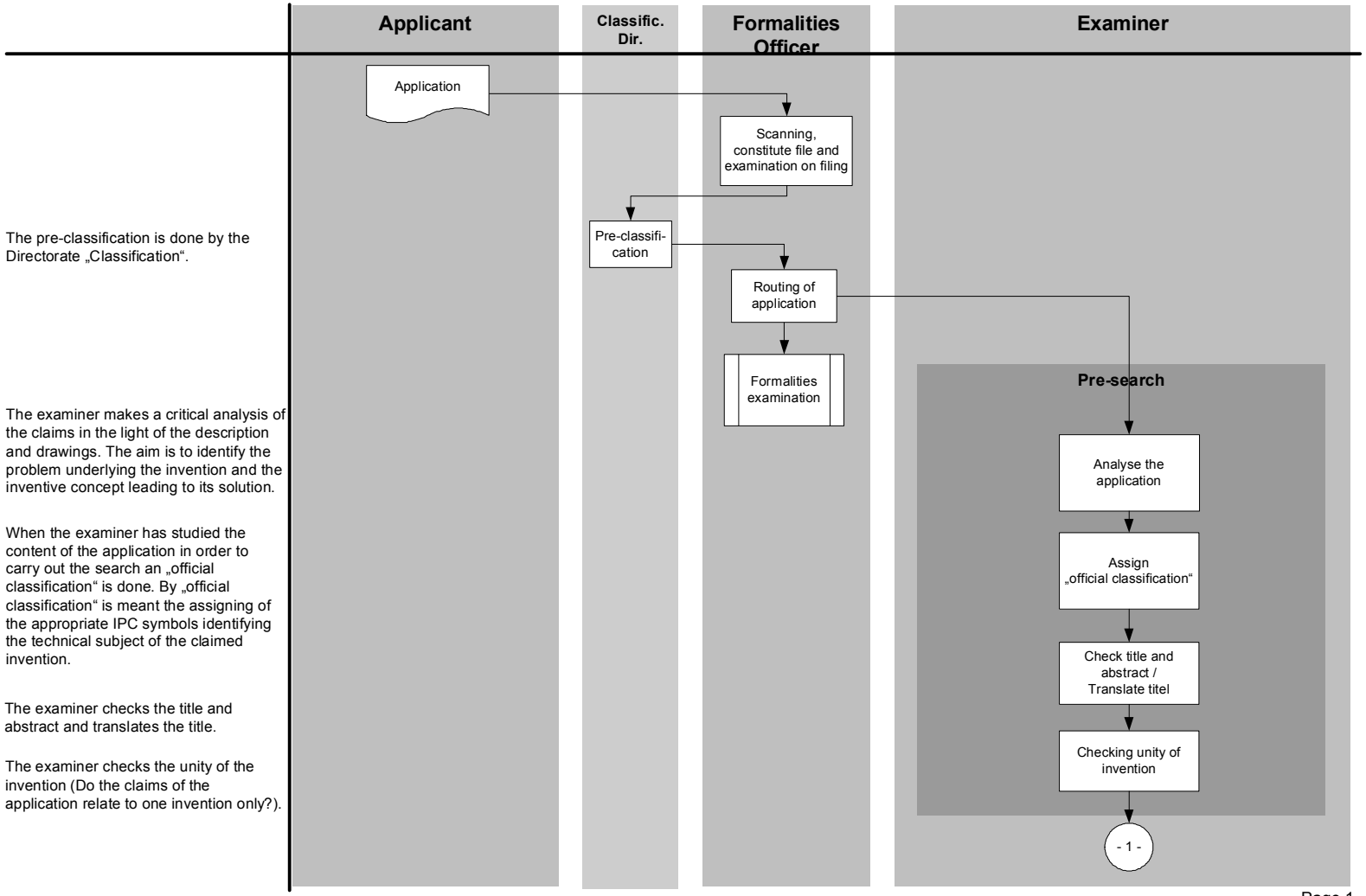


Decision point

On-Page-Reference

EPO - office-specific process flowchart

EPO: Generic Patent Granting Process



The pre-classification is done by the Directorate „Classification“.

The examiner makes a critical analysis of the claims in the light of the description and drawings. The aim is to identify the problem underlying the invention and the inventive concept leading to its solution.

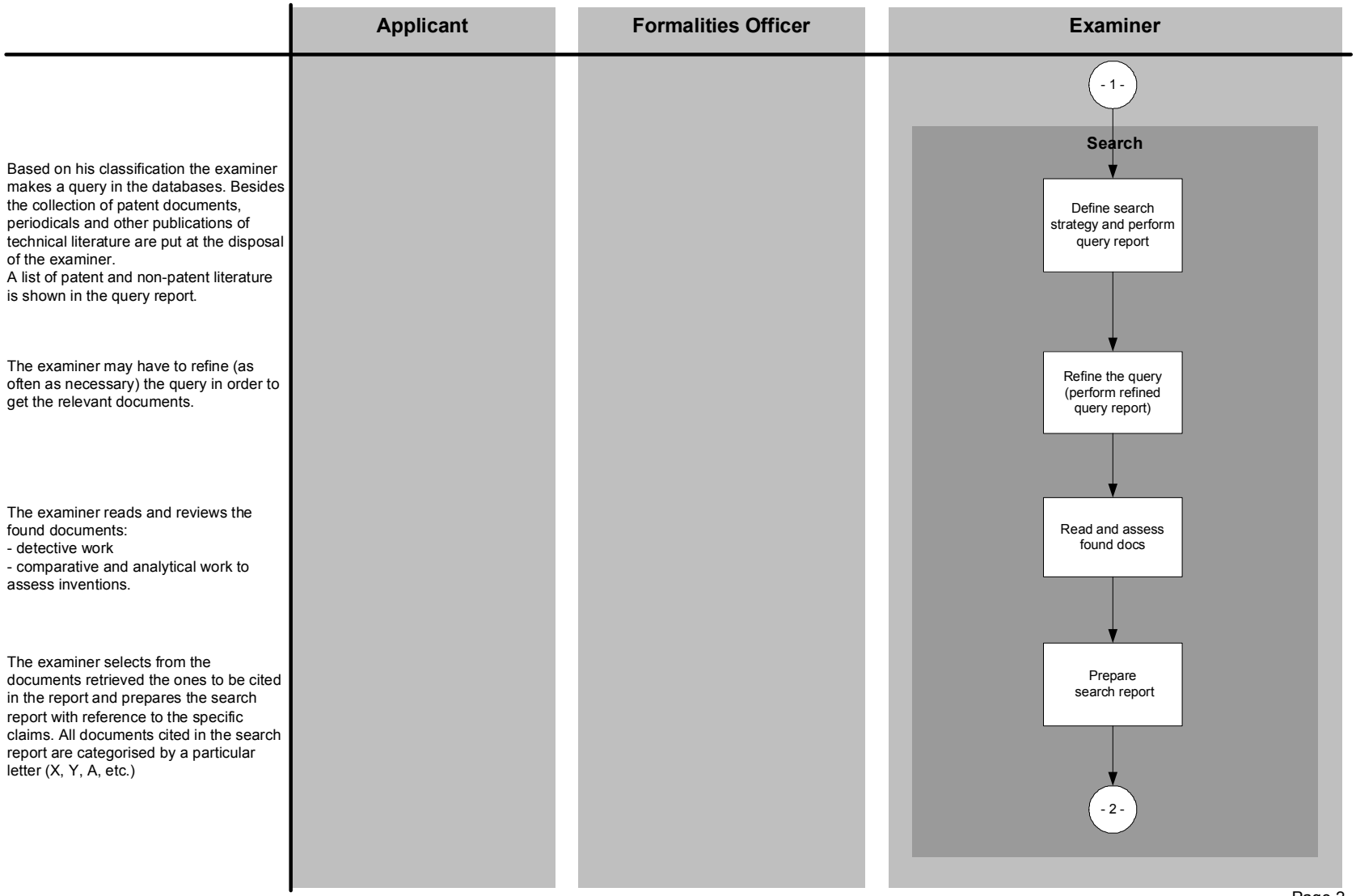
When the examiner has studied the content of the application in order to carry out the search an „official classification“ is done. By „official classification“ is meant the assigning of the appropriate IPC symbols identifying the technical subject of the claimed invention.

The examiner checks the title and abstract and translates the title.

The examiner checks the unity of the invention (Do the claims of the application relate to one invention only?).

Page 1

EPO: Generic Patent Granting Process



Page 2

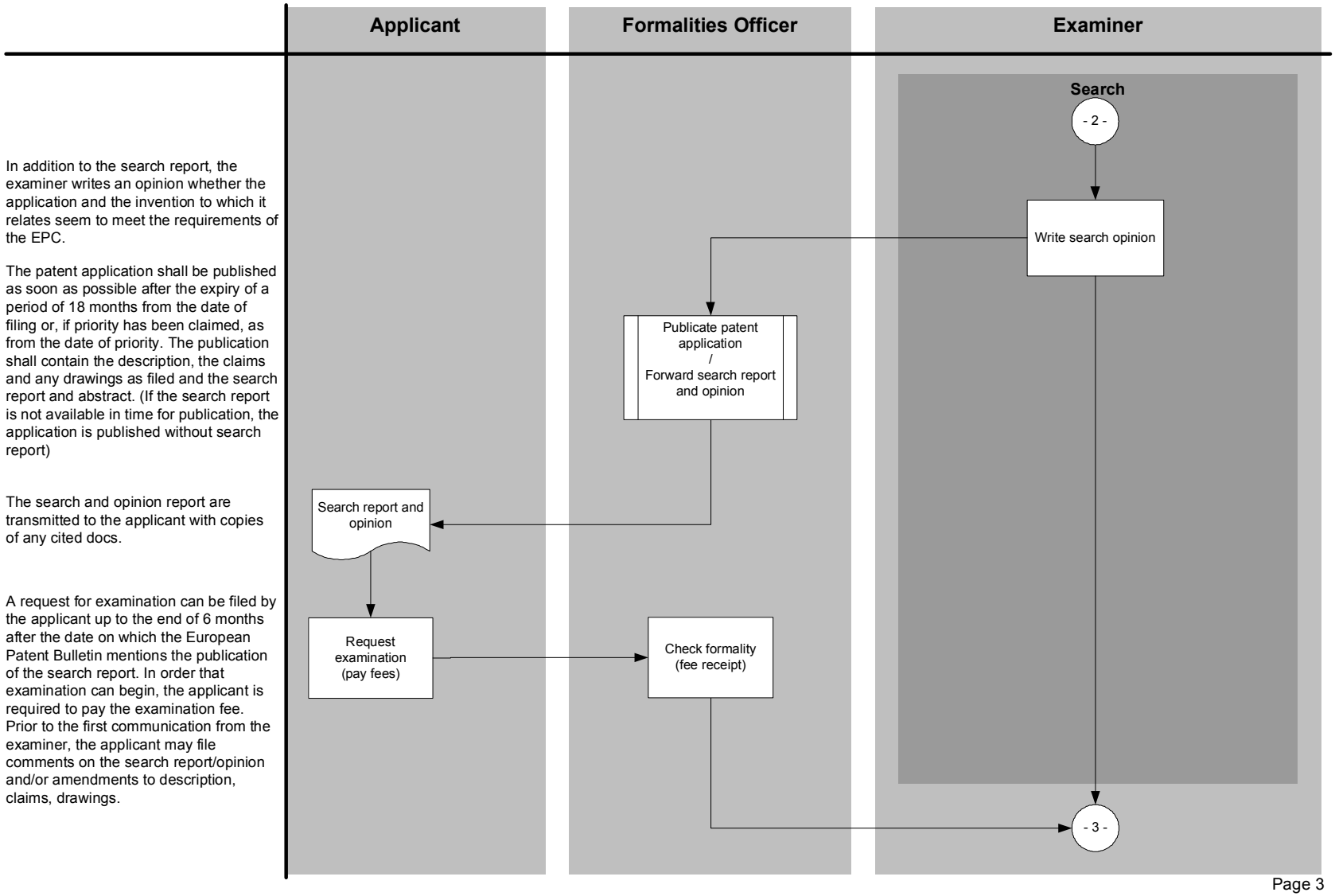
EPO: Generic Patent Granting Process

In addition to the search report, the examiner writes an opinion whether the application and the invention to which it relates seem to meet the requirements of the EPC.

The patent application shall be published as soon as possible after the expiry of a period of 18 months from the date of filing or, if priority has been claimed, as from the date of priority. The publication shall contain the description, the claims and any drawings as filed and the search report and abstract. (If the search report is not available in time for publication, the application is published without search report)

The search and opinion report are transmitted to the applicant with copies of any cited docs.

A request for examination can be filed by the applicant up to the end of 6 months after the date on which the European Patent Bulletin mentions the publication of the search report. In order that examination can begin, the applicant is required to pay the examination fee. Prior to the first communication from the examiner, the applicant may file comments on the search report/opinion and/or amendments to description, claims, drawings.



Page 3

EPO: Generic Patent Granting Process

The examiner's first step is to study the claims of the application, concentrating on any amendments and/or comments filed by the applicant in response to the search opinion.

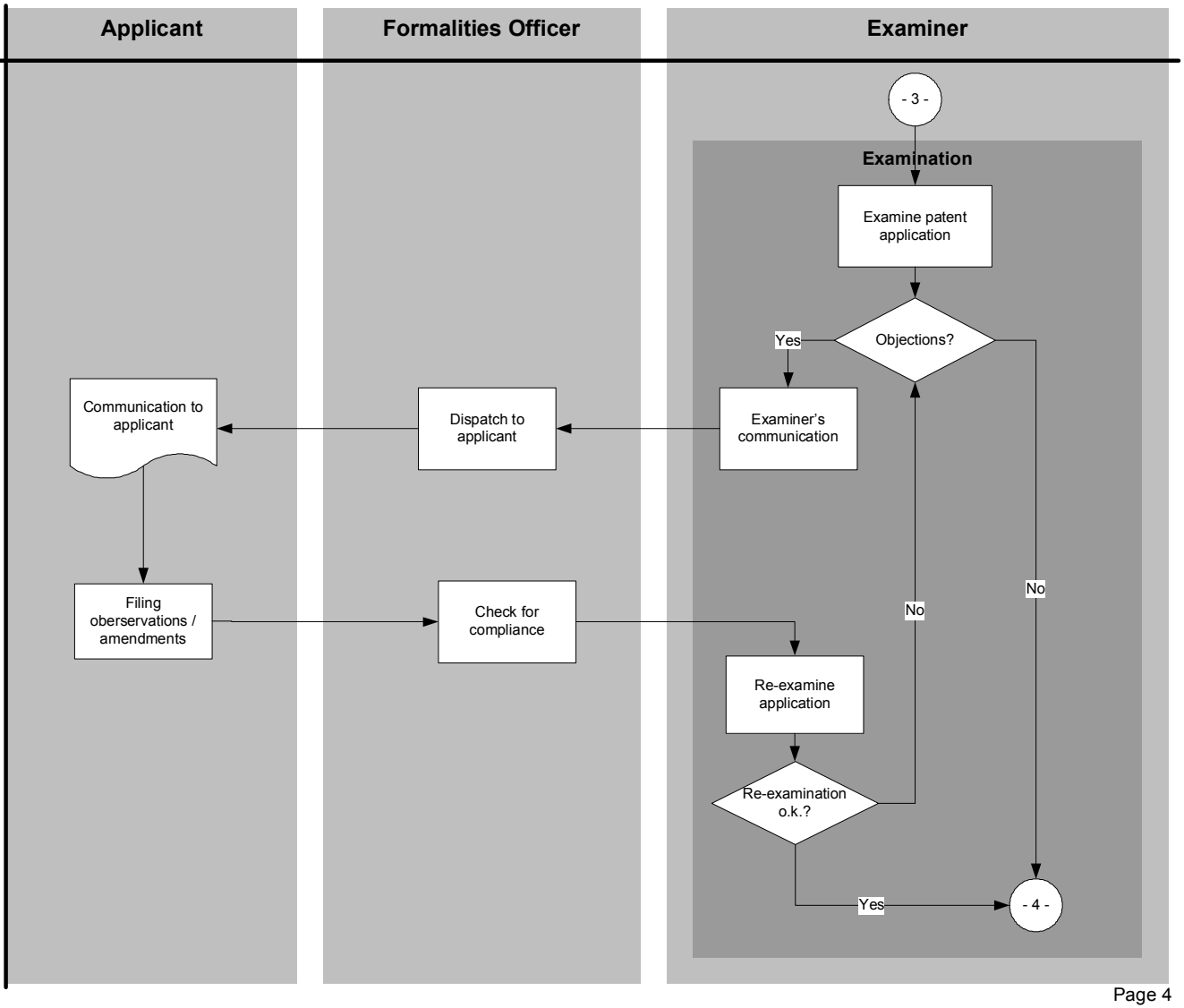
If the examination reveals that the application or the invention to which it relates does not meet the requirements of the EPC, the Examining Division* invites the applicant, as often as necessary, to file his observations.

* An Examining Division consists normally of 3 technical examiners. However one member (the „primary examiner") will be entrusted to carry out all the work up to the point of decision to grant or refuse the application.

Following the applicant's reply to the first communication, the examiner must re-examine the application taking into account the observations or amendments made by the apllicant.

If the re-examination shows that there are still objections to be met, the examiner must consider whether they can best be resolved by a further written communication, telephone discussion or a oral proceeding.

If the applicant fails to reply in due time to any invitation, the application shall be deemed to be withdrawn.



Page 4

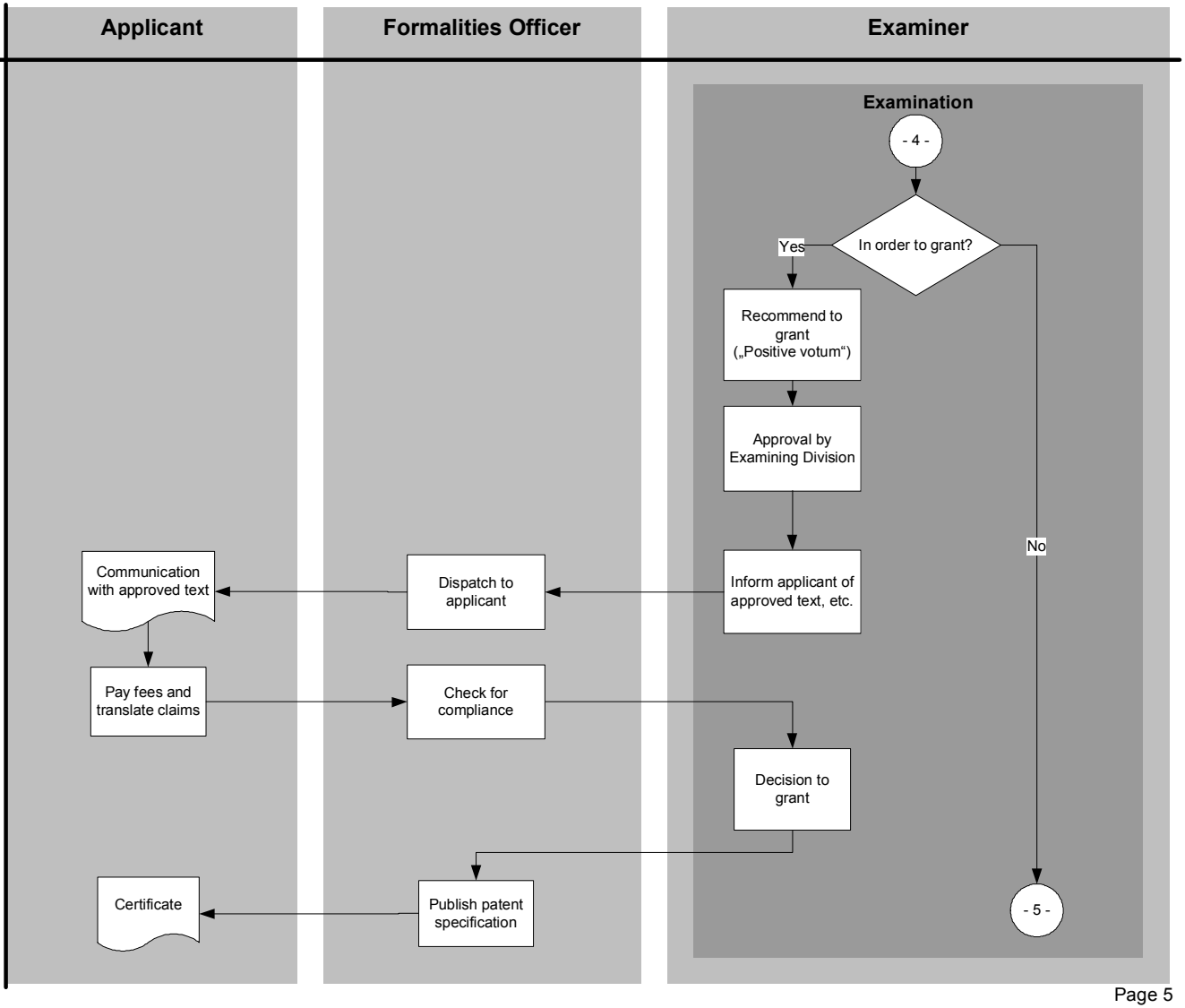
EPO: Generic Patent Granting Process

If the examiner considers that the application **satisfies** the requirements of the EPC and is thus in order to grant, he writes a brief report (the „positive votum“).

Positive „Votum“: The examiner refers the application to the other members of the Examining Division. They consider the case individually and if there is agreement with the recommendation of the priminary examiner, the application is in order to grant.

Once the Examining Division has decided that a patent can be granted, it will first issue a communication informing the applicant of the text on the basis of which it itends to do so, and writing the applicant to pay the fees and to file a translation of the claims.

If the applicant has fullfilled the requirements, it is decided that a patent will be granted.
As soon as the patent specification has been published, the EPO issues the proprietor with a certificate.



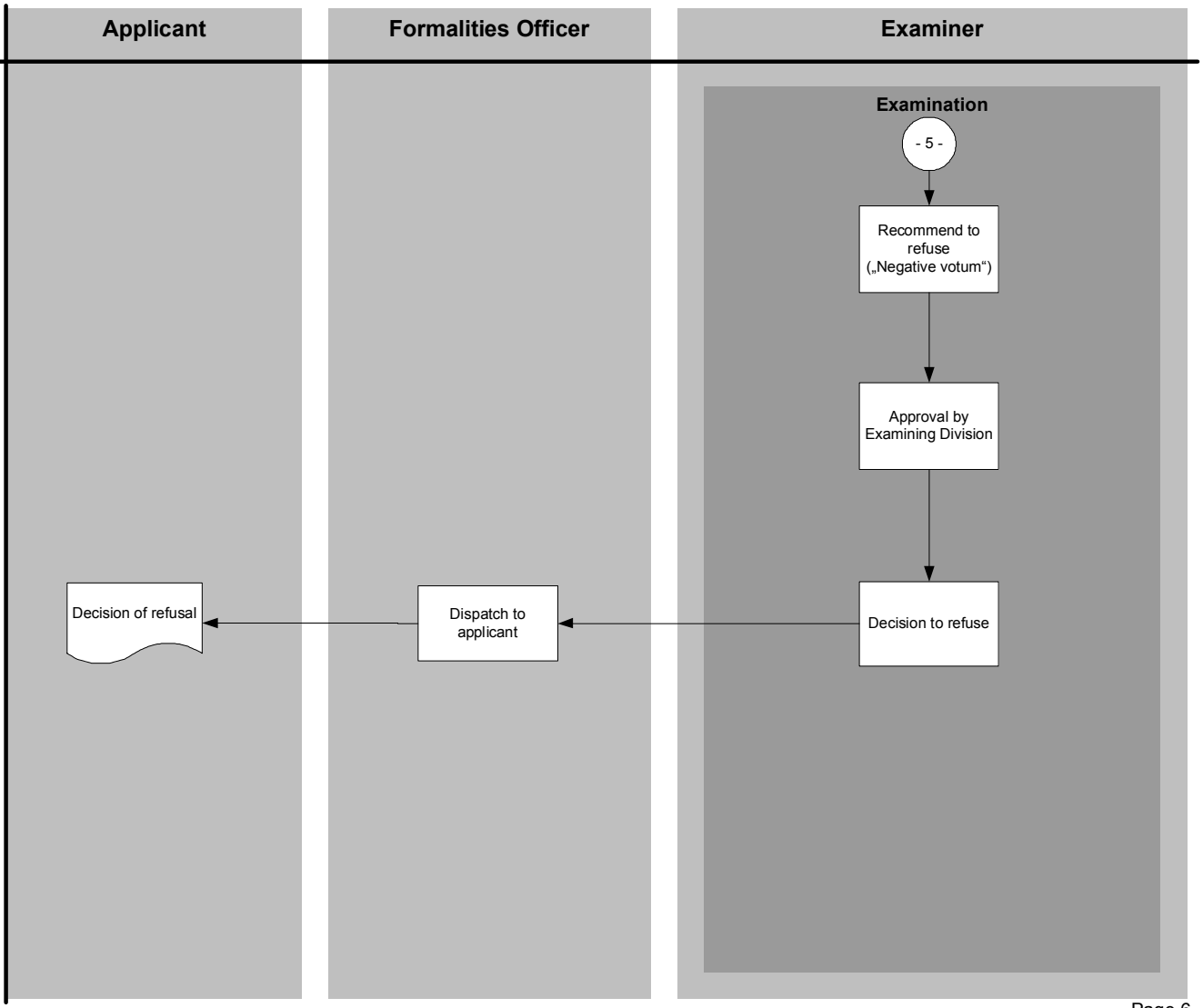
Page 5

EPO: Generic Patent Granting Process

If the examiner considers that the application does **not** satisfy the requirements of the EPC, he writes a brief report (the „negative votum“) recommending the refusal of the application.

Negative „Votum“: The examiner refers the application („Votum“) formally to the other members of the Examining Division. They consider the case individually and if there is complete agreement with the recommendation of the priminary examiner, the application can be refused.

If the Examining Division is satisfied that the applicant has had a sufficient opportunity to amend and that all the requirements are still not met, it issues a decision to refuse the application.



Page 6

EPO - product-specific comparison

Generic Process Model | Comparison of the product-specific processes at the EPO [1/6]

Based on the comparison of the product-specific processes the following major deviations could be detected:

	Steps / Activities	EP			PCT I			Euro-PCT		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Allocation	▪ File application (or enter European phase)	X			X			X		
	▪ Constitute file and examination on filing		X			X(1)			X(2)	
	▪ Pre-classification / allocation				Pre-classification is done by Dir. "Classification")				X(3)	
	▪ Check formalities		X			X(1)			X	
Pre-Search	▪ Analyse application (is a meaningful search feasible?)			X			X			X
	▪ Assign classification			X			X			
	▪ Check title/abstract			X			X			
	▪ Check unity of invention			X			X			X
	.....		.....			.....			.....	

(1) Where EPO is Receiving Office
(2) No examination on filing
(3) No pre-classification

Generic Process Model | Comparison of the product-specific processes at the EPO [2/6]

	Steps / Activities	EP			PCT			Euro-PCT(1)		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Search	▪ Determine search strategy and perform query			X			X			X
	▪ Refine query			X			X			X
	▪ Read and assess found docs			X			X			X
	▪ Write search report			X			X			X
	▪ Write WO/search opinion			X			X			X
	▪ Forward search report and opinion to applicant		X			X			X	
	▪ Publish patent application		X							
	.....		.....			.....			.....	

(1) Search activities only where EPO was not ISA

Generic Process Model | Comparison of the product-specific processes at the EPO [3/6]

	Steps / Activities	EP			PCT			Euro-PCT		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Examination	▪ Request examination	X						X		
	▪ Check formalities		X						X	
	▪ Examine patent applicat. as filed or amended			X						X
	▪ Objections to be raised?			X						X
	▪ Write communication			X						X
	▪ Dispatch communication to applicant		X						X	
	▪ File observations / amendments	X						X		
	▪ Check formalities		X						X	
	▪ Re-examine application			X						X
	.....		.....			.....			.....	

Generic Process Model | Comparison of the product-specific processes at the EPO [4/6]

	Steps / Activities	EP			PCT			Euro-PCT		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Examination	▪ Write further communication/contact applicant			X(1)						X(1)
	▪ Request for hearing	X						X		
	▪ Hold hearing and write minutes			X						X
	▪ Make top-up search			X						X
	.....		.....			.....			.....	

(1) Interviews, phone calls, etc.

Generic Process Model | Comparison of the product-specific processes at the EPO [5/6]

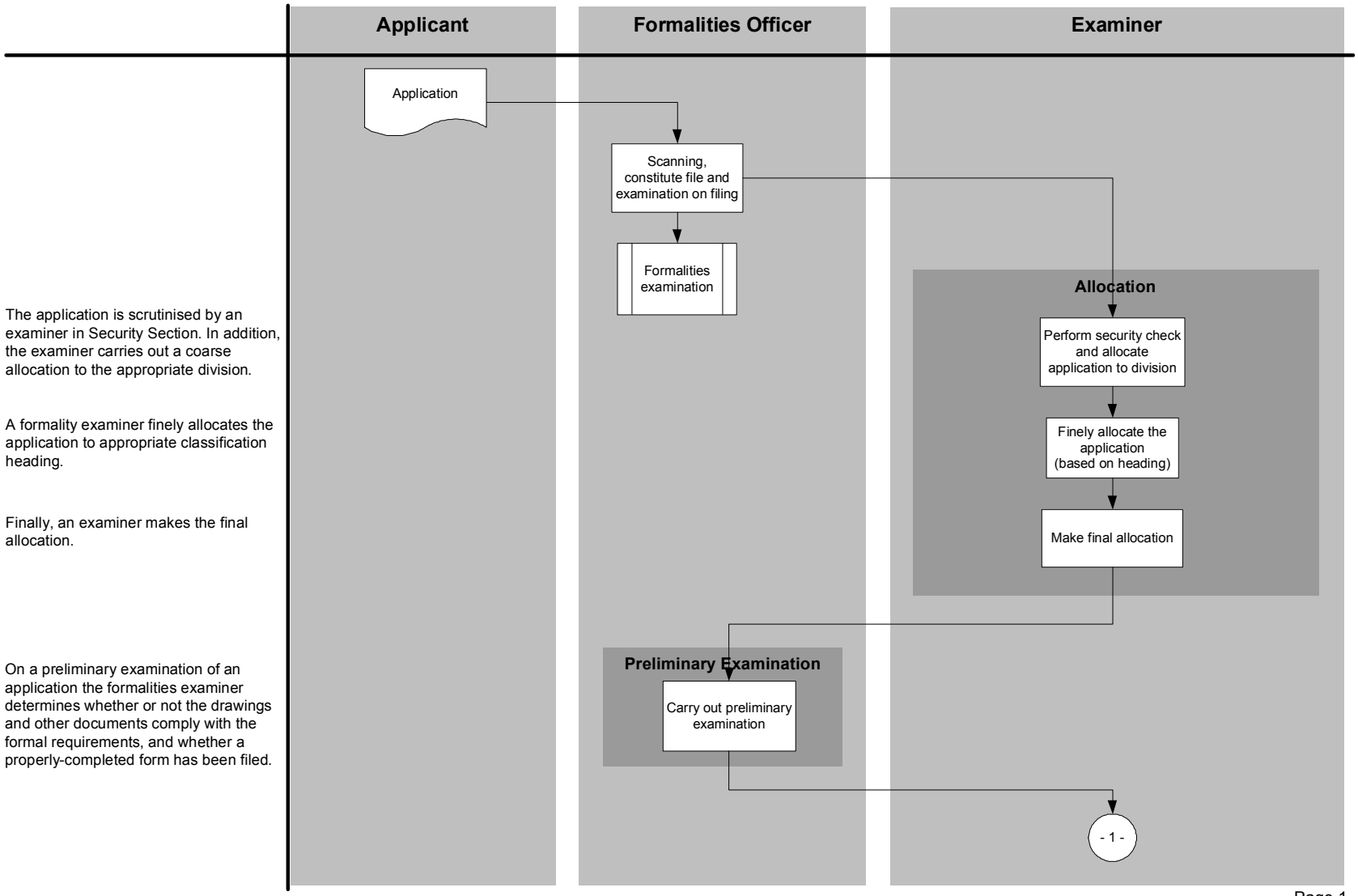
	Steps / Activities	EP			PCT			Euro-PCT		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Final stage grant	▪ In order for grant? (YES)			X						X
	▪ Recommend to grant, draft decision			X						X
	▪ Approve by Examining Division			X						X
	▪ Inform applicant of approved text, etc.			X						X
	▪ Dispatch approved text to applicant		X						X	
	▪ Translate claims, pay fees	X						X		
	▪ Check formalities		X						X	
	▪ Take decision to grant			X						X
	▪ Publish patent specification		X						X	
			.....			.....			.....	

Generic Process Model | Comparison of the product-specific processes at the EPO [6/6]

	Steps / Activities	EP			PCT			Euro-PCT		
		Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner	Applicant	Formalities Officer	Examiner
Final stage refusal	▪ In order for grant ? (NO)			X						X
	▪ Recommend to refuse, draft decision			X						X
	▪ Approve by Examining Division			X						X
	▪ Take decision to refuse			X						X
	▪ Dispatch decision to applicant		X						X	

UKIPO office-specific process flowchart

UKPO: Generic Patent Granting Process



The application is scrutinised by an examiner in Security Section. In addition, the examiner carries out a coarse allocation to the appropriate division.

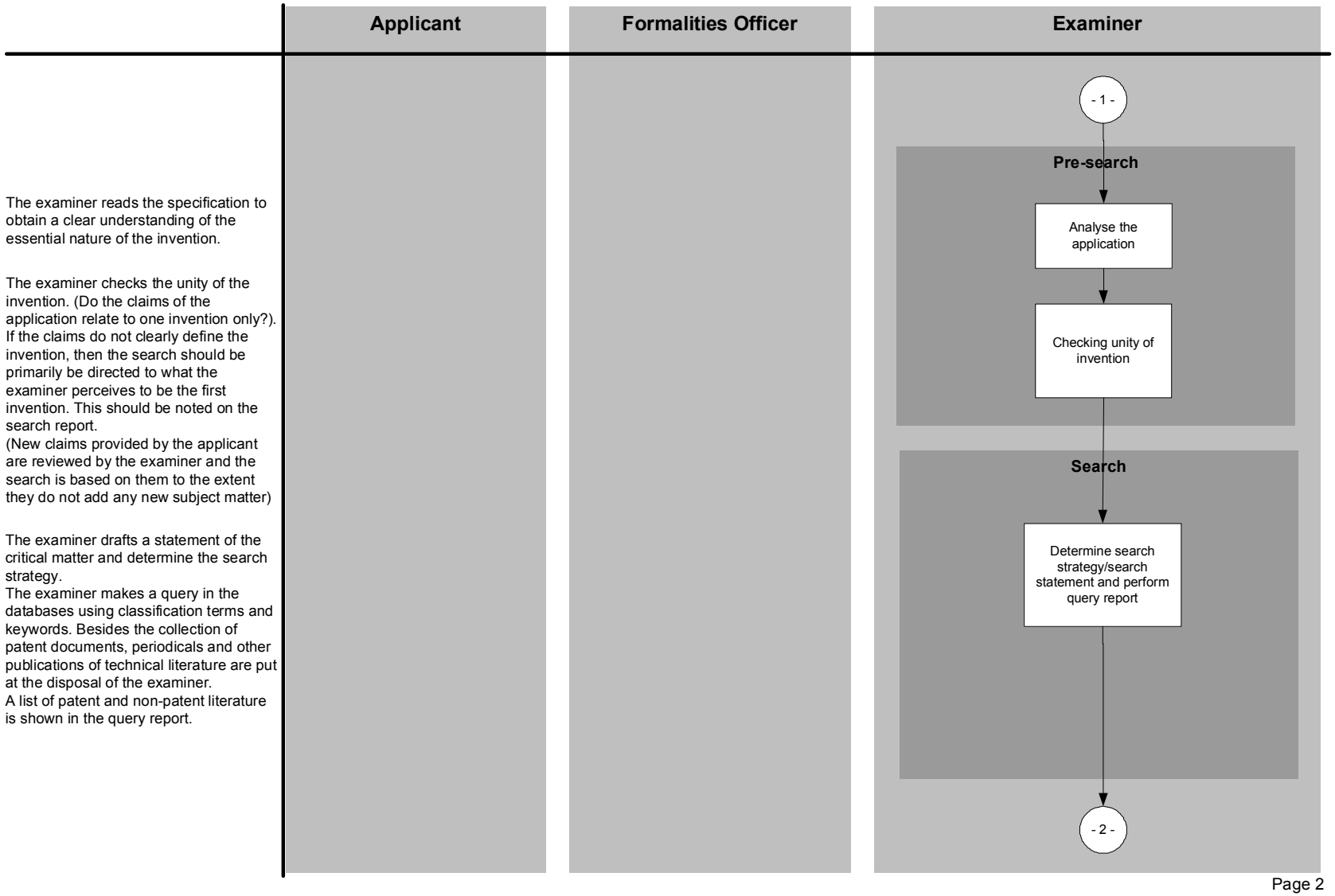
A formality examiner finely allocates the application to appropriate classification heading.

Finally, an examiner makes the final allocation.

On a preliminary examination of an application the formalities examiner determines whether or not the drawings and other documents comply with the formal requirements, and whether a properly-completed form has been filed.

Page 1

UKPO: Generic Patent Granting Process

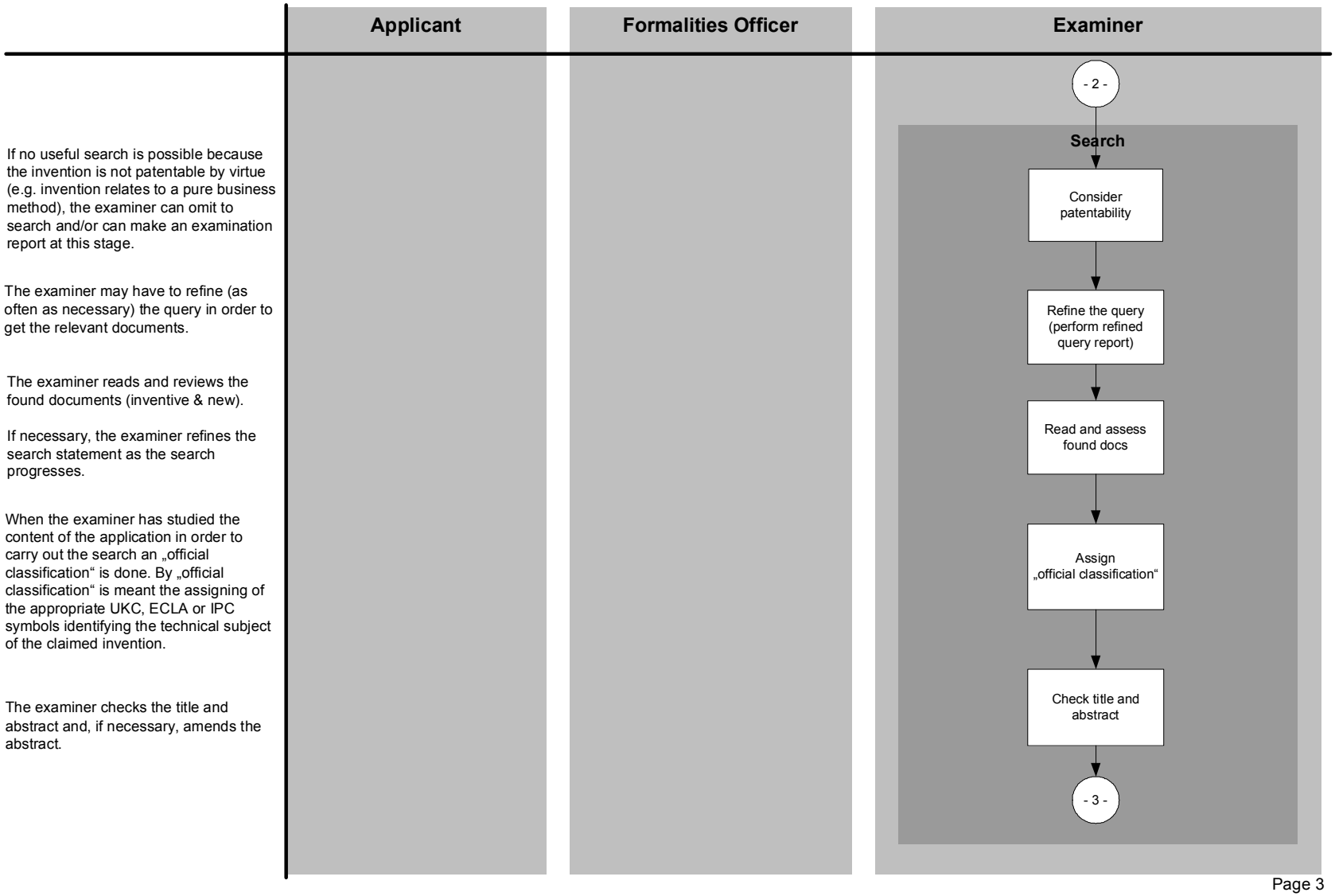


The examiner reads the specification to obtain a clear understanding of the essential nature of the invention.

The examiner checks the unity of the invention. (Do the claims of the application relate to one invention only?). If the claims do not clearly define the invention, then the search should be primarily be directed to what the examiner perceives to be the first invention. This should be noted on the search report.
(New claims provided by the applicant are reviewed by the examiner and the search is based on them to the extent they do not add any new subject matter)

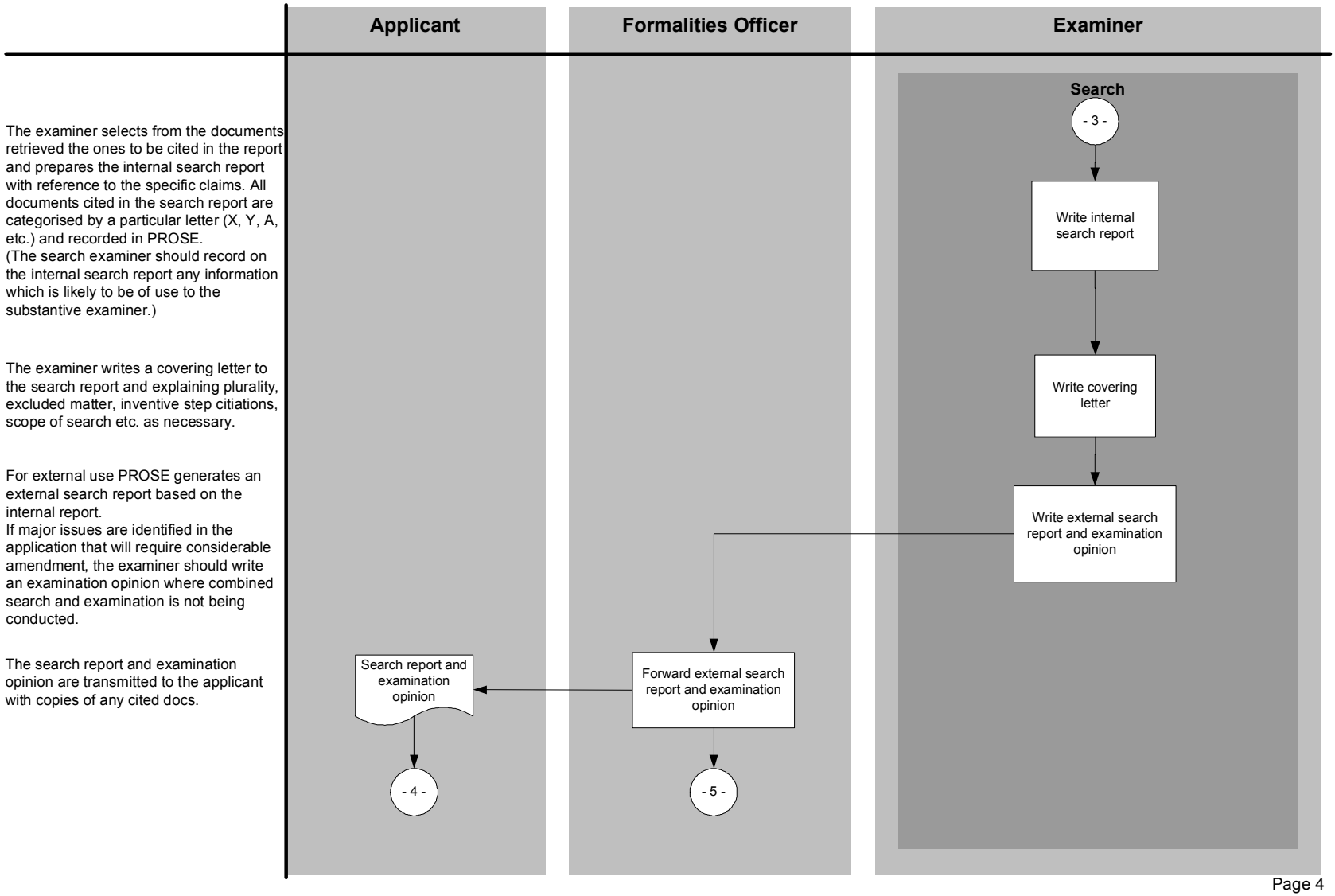
The examiner drafts a statement of the critical matter and determine the search strategy.
The examiner makes a query in the databases using classification terms and keywords. Besides the collection of patent documents, periodicals and other publications of technical literature are put at the disposal of the examiner.
A list of patent and non-patent literature is shown in the query report.

UKPO: Generic Patent Granting Process



Page 3

UKPO: Generic Patent Granting Process



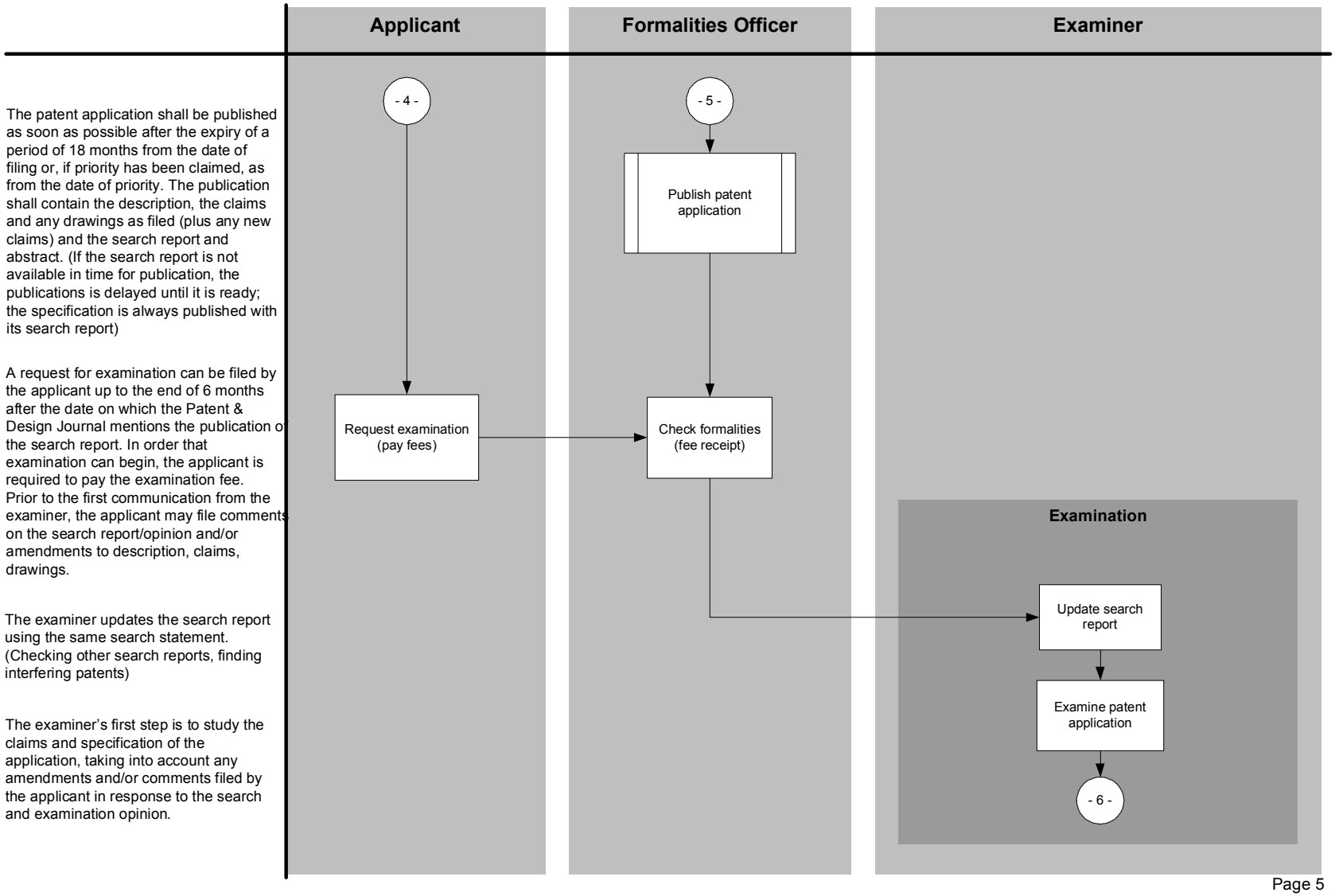
The examiner selects from the documents retrieved the ones to be cited in the report and prepares the internal search report with reference to the specific claims. All documents cited in the search report are categorised by a particular letter (X, Y, A, etc.) and recorded in PROSE.
(The search examiner should record on the internal search report any information which is likely to be of use to the substantive examiner.)

The examiner writes a covering letter to the search report and explaining plurality, excluded matter, inventive step citiations, scope of search etc. as necessary.

For external use PROSE generates an external search report based on the internal report.
If major issues are identified in the application that will require considerable amendment, the examiner should write an examination opinion where combined search and examination is not being conducted.

The search report and examination opinion are transmitted to the applicant with copies of any cited docs.

UKPO: Generic Patent Granting Process



The patent application shall be published as soon as possible after the expiry of a period of 18 months from the date of filing or, if priority has been claimed, as from the date of priority. The publication shall contain the description, the claims and any drawings as filed (plus any new claims) and the search report and abstract. (If the search report is not available in time for publication, the publications is delayed until it is ready; the specification is always published with its search report)

A request for examination can be filed by the applicant up to the end of 6 months after the date on which the Patent & Design Journal mentions the publication of the search report. In order that examination can begin, the applicant is required to pay the examination fee. Prior to the first communication from the examiner, the applicant may file comments on the search report/opinion and/or amendments to description, claims, drawings.

The examiner updates the search report using the same search statement. (Checking other search reports, finding interfering patents)

The examiner's first step is to study the claims and specification of the application, taking into account any amendments and/or comments filed by the applicant in response to the search and examination opinion.

Page 5

UKPO: Generic Patent Granting Process

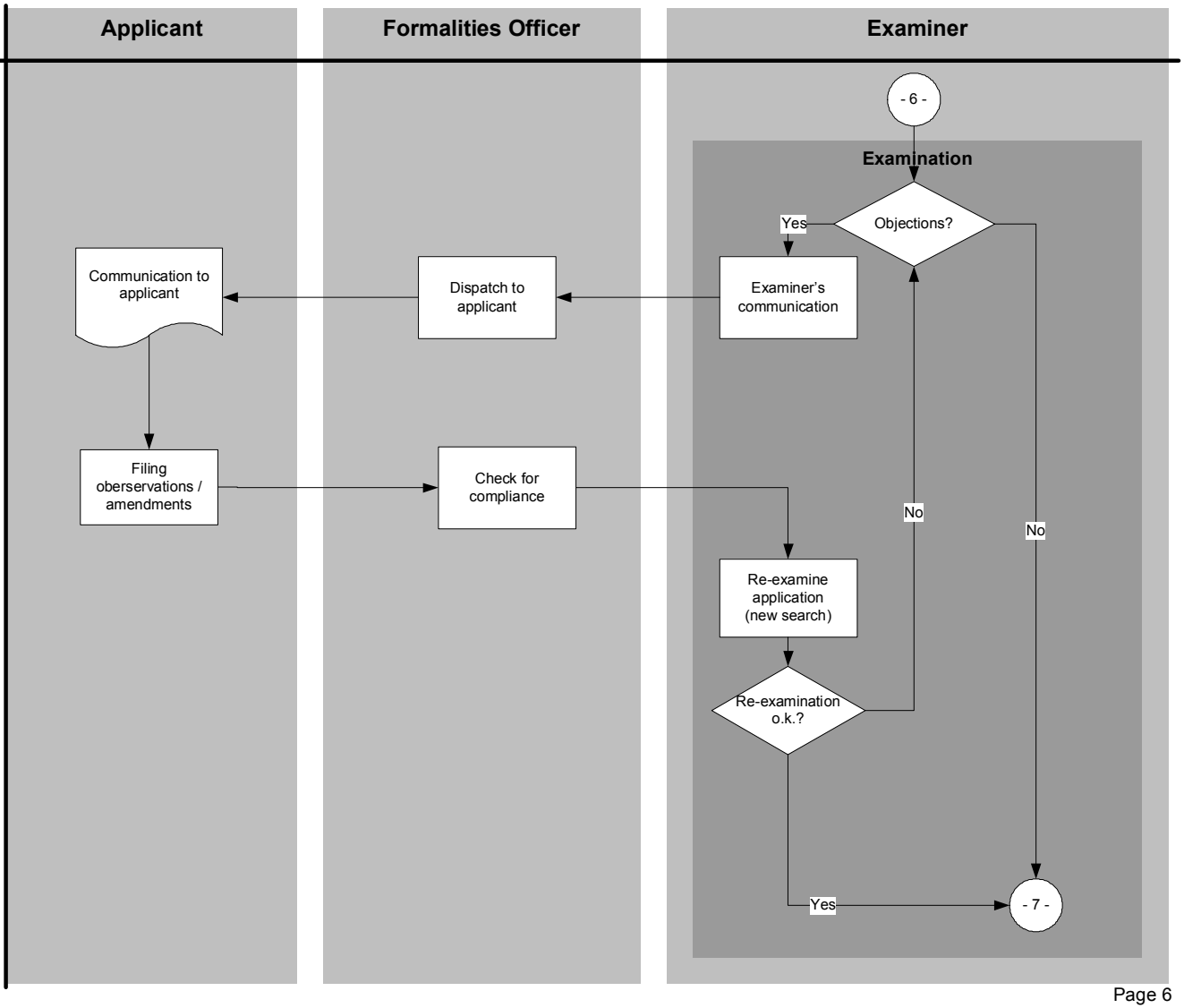
If the examination reveals that the application or the invention to which it relates does not meet the requirements of the Patents Act 1977, the examiner writes a report stating his objections and invites the applicant to file amendments to rectify the deficiencies or observations.

Following the applicant's reply to the first communication, the examiner must re-examine the application taking into account the observations or amendments made by the applicant and, if necessary, carry out further search.

If the re-examination shows that there are still objections to be met, the examiner must consider whether they can best be resolved by a further written communication, telephone discussion or a personal interview.

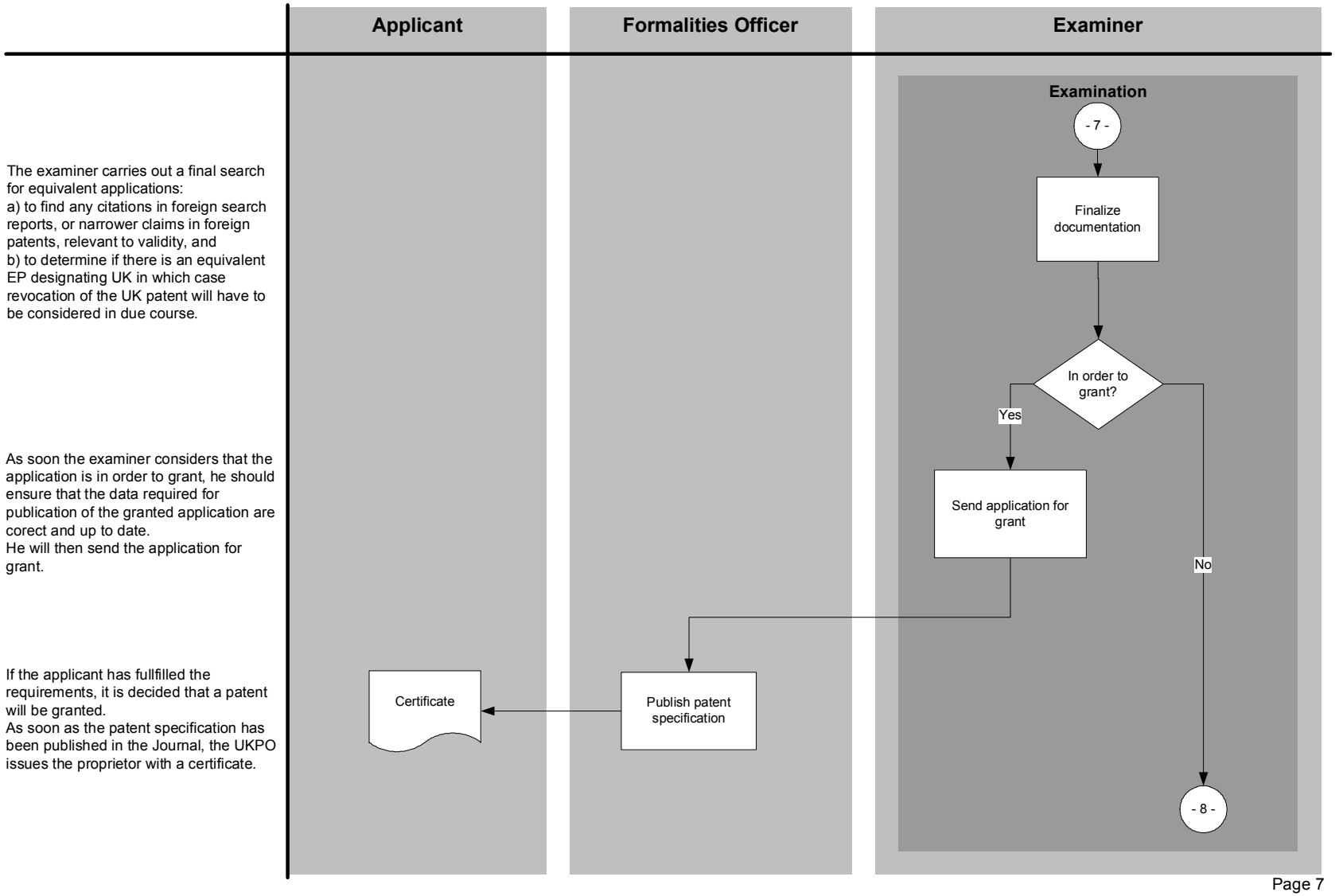
If the examiner and applicant fail to reach agreement, an offer of a hearing should be made by the examiner. The examiner should issue a hearing report to applicant. This report should define all the issues to be considered at the hearing, setting out the relevant arguments on each one.

If the applicant fails to reply in due time to any invitation, the application shall be deemed to be withdrawn.



Page 6

UKPO: Generic Patent Granting Process



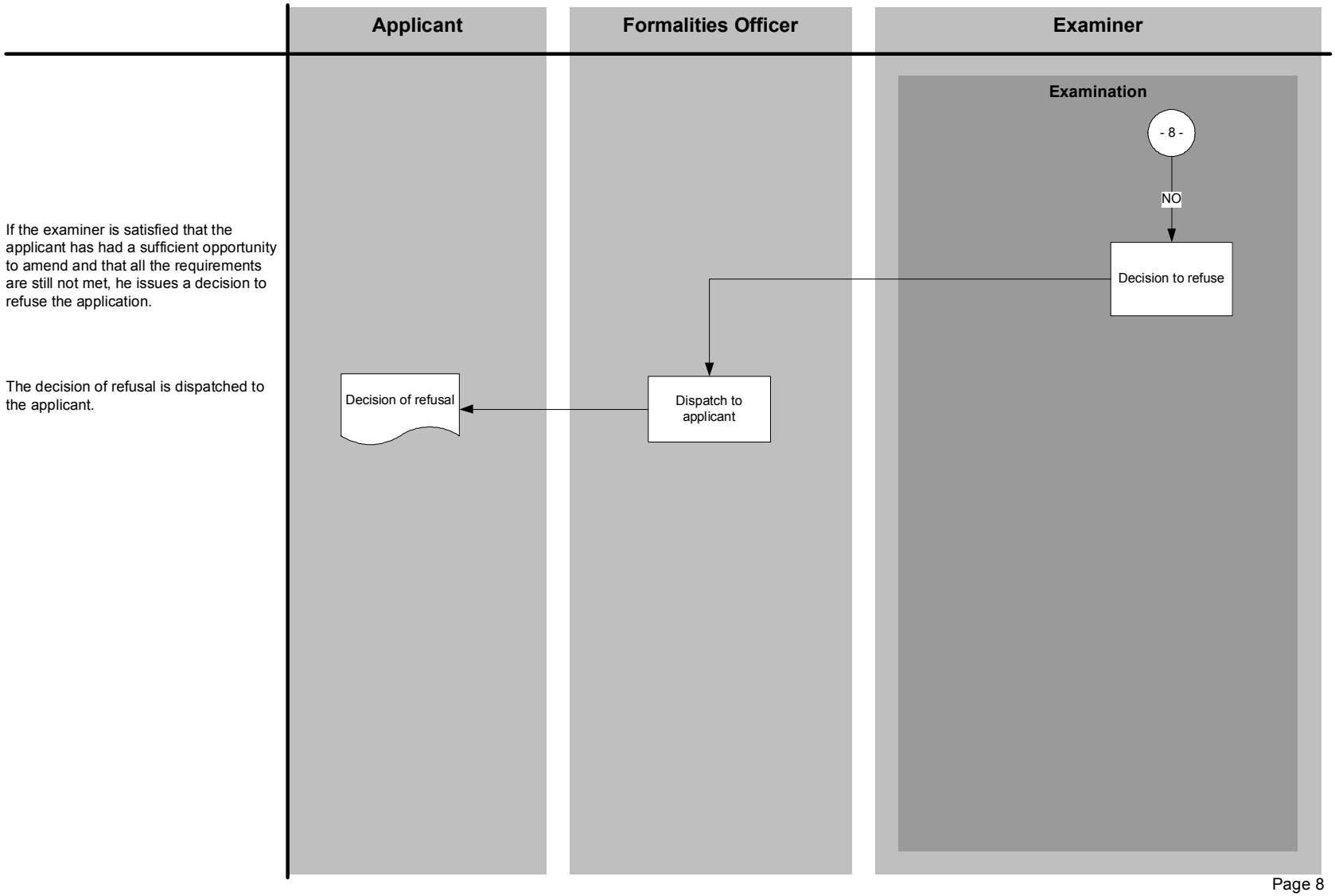
The examiner carries out a final search for equivalent applications:
a) to find any citations in foreign search reports, or narrower claims in foreign patents, relevant to validity, and
b) to determine if there is an equivalent EP designating UK in which case revocation of the UK patent will have to be considered in due course.

As soon the examiner considers that the application is in order to grant, he should ensure that the data required for publication of the granted application are corect and up to date.
He will then send the application for grant.

If the applicant has fullfilled the requirements, it is decided that a patent will be granted.
As soon as the patent specification has been published in the Journal, the UKPO issues the proprietor with a certificate.

Page 7

UKPO: Generic Patent Granting Process



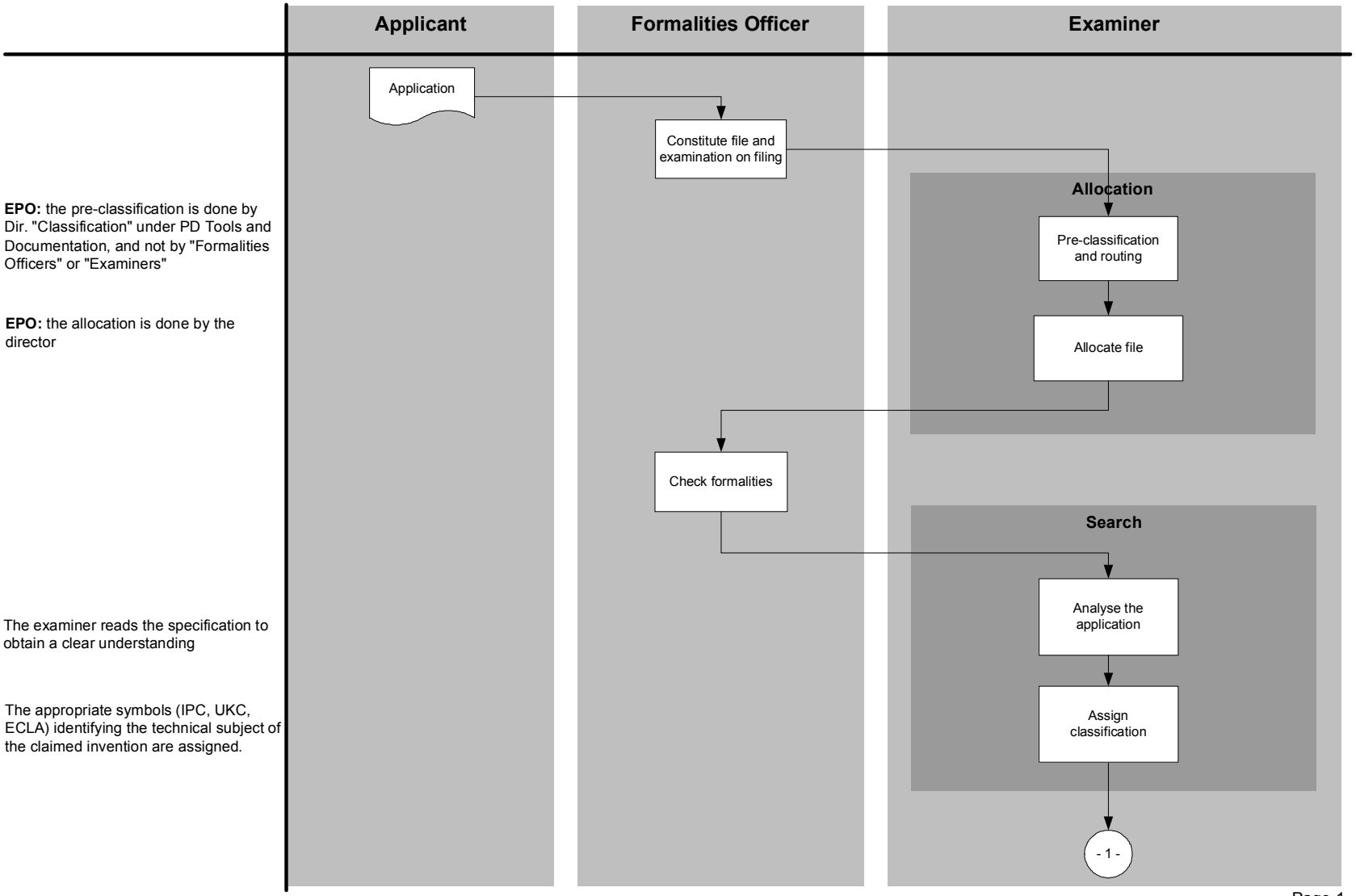
If the examiner is satisfied that the applicant has had a sufficient opportunity to amend and that all the requirements are still not met, he issues a decision to refuse the application.

The decision of refusal is dispatched to the applicant.

Page 8

Flowchart of the generic process for all offices

Generic Patent Granting Process for all offices



EPO: the pre-classification is done by Dir. "Classification" under PD Tools and Documentation, and not by "Formalities Officers" or "Examiners"

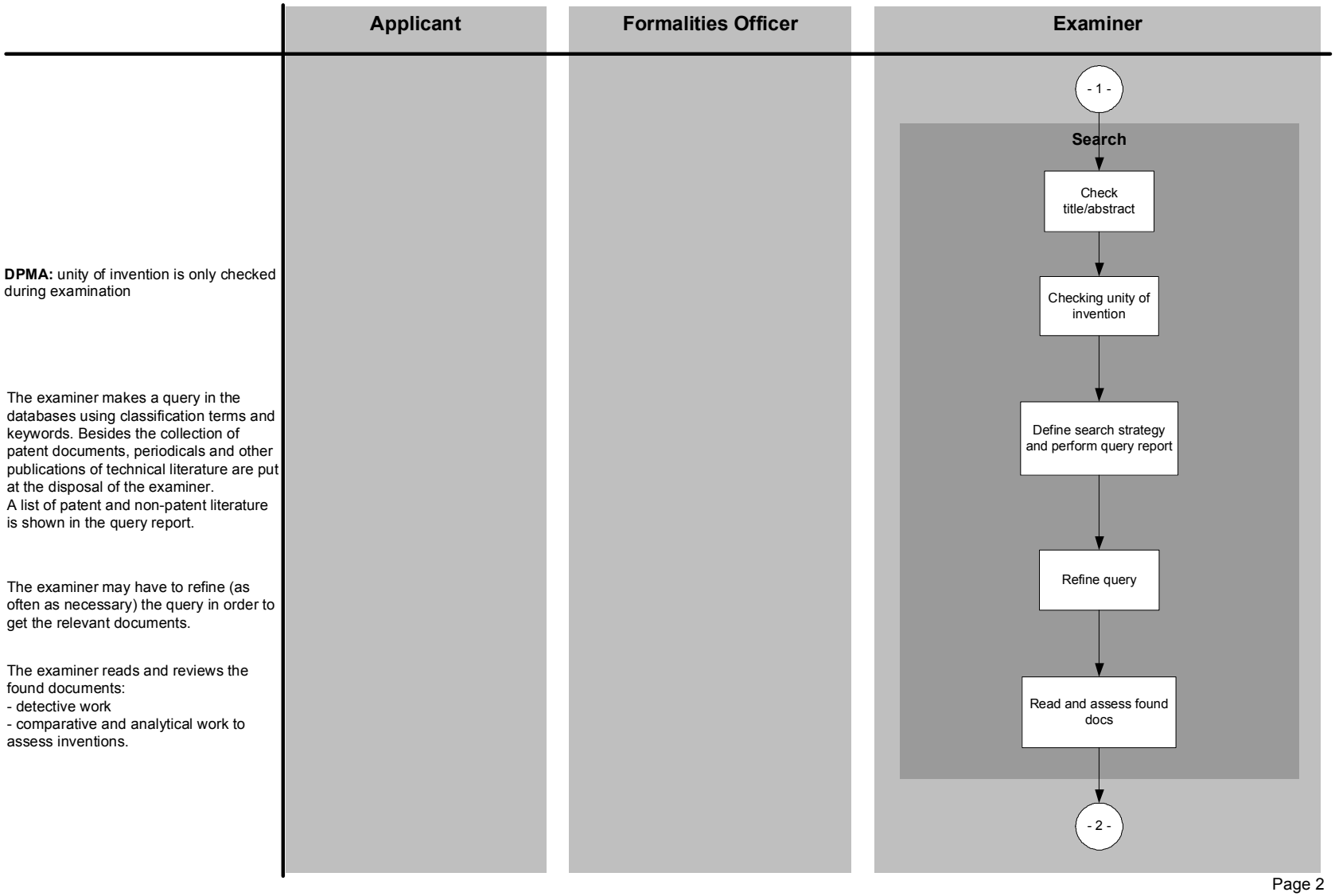
EPO: the allocation is done by the director

The examiner reads the specification to obtain a clear understanding

The appropriate symbols (IPC, UKC, ECLA) identifying the technical subject of the claimed invention are assigned.

Page 1

Generic Patent Granting Process for all offices



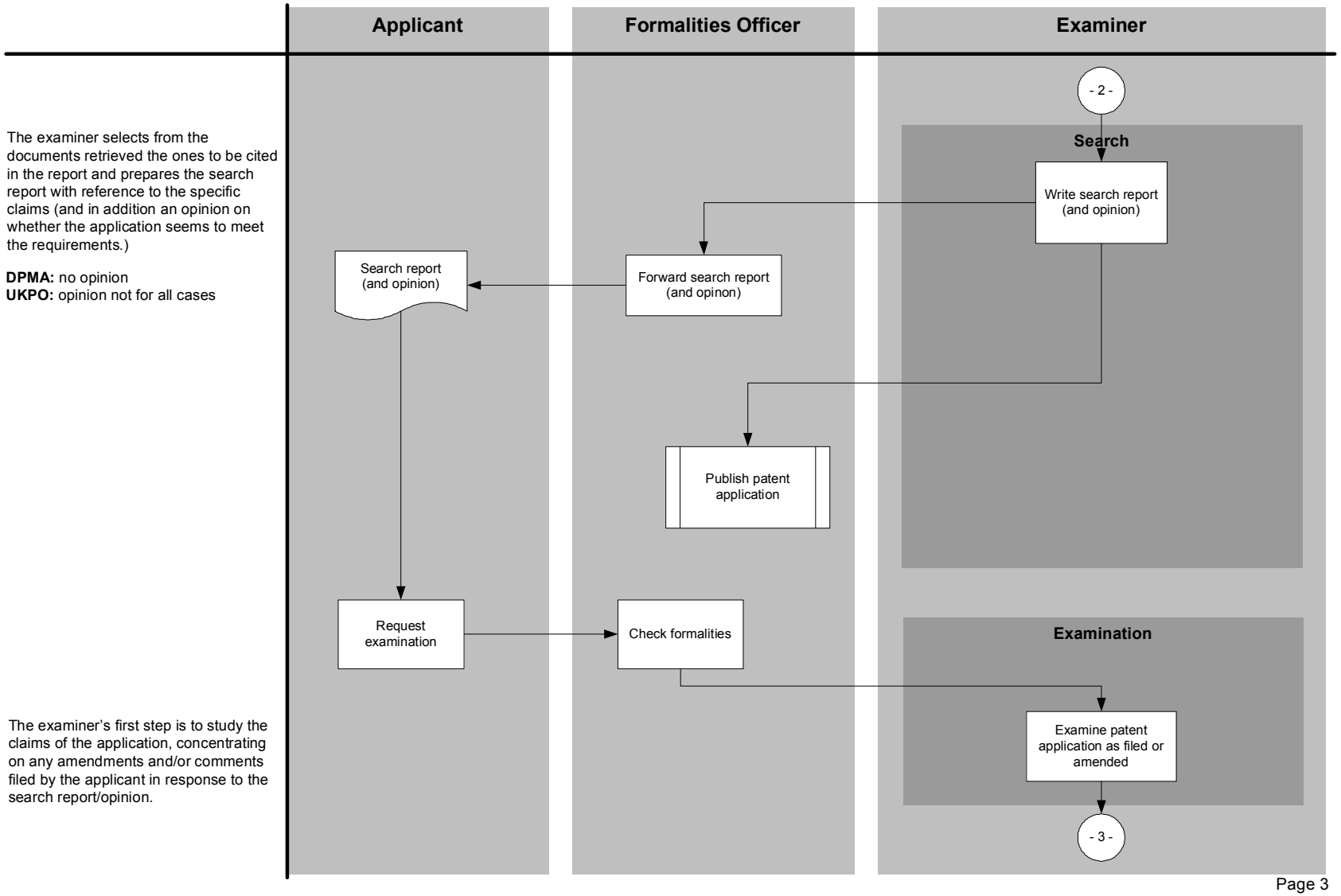
DPMA: unity of invention is only checked during examination

The examiner makes a query in the databases using classification terms and keywords. Besides the collection of patent documents, periodicals and other publications of technical literature are put at the disposal of the examiner.
A list of patent and non-patent literature is shown in the query report.

The examiner may have to refine (as often as necessary) the query in order to get the relevant documents.

The examiner reads and reviews the found documents:
- detective work
- comparative and analytical work to assess inventions.

Generic Patent Granting Process for all offices

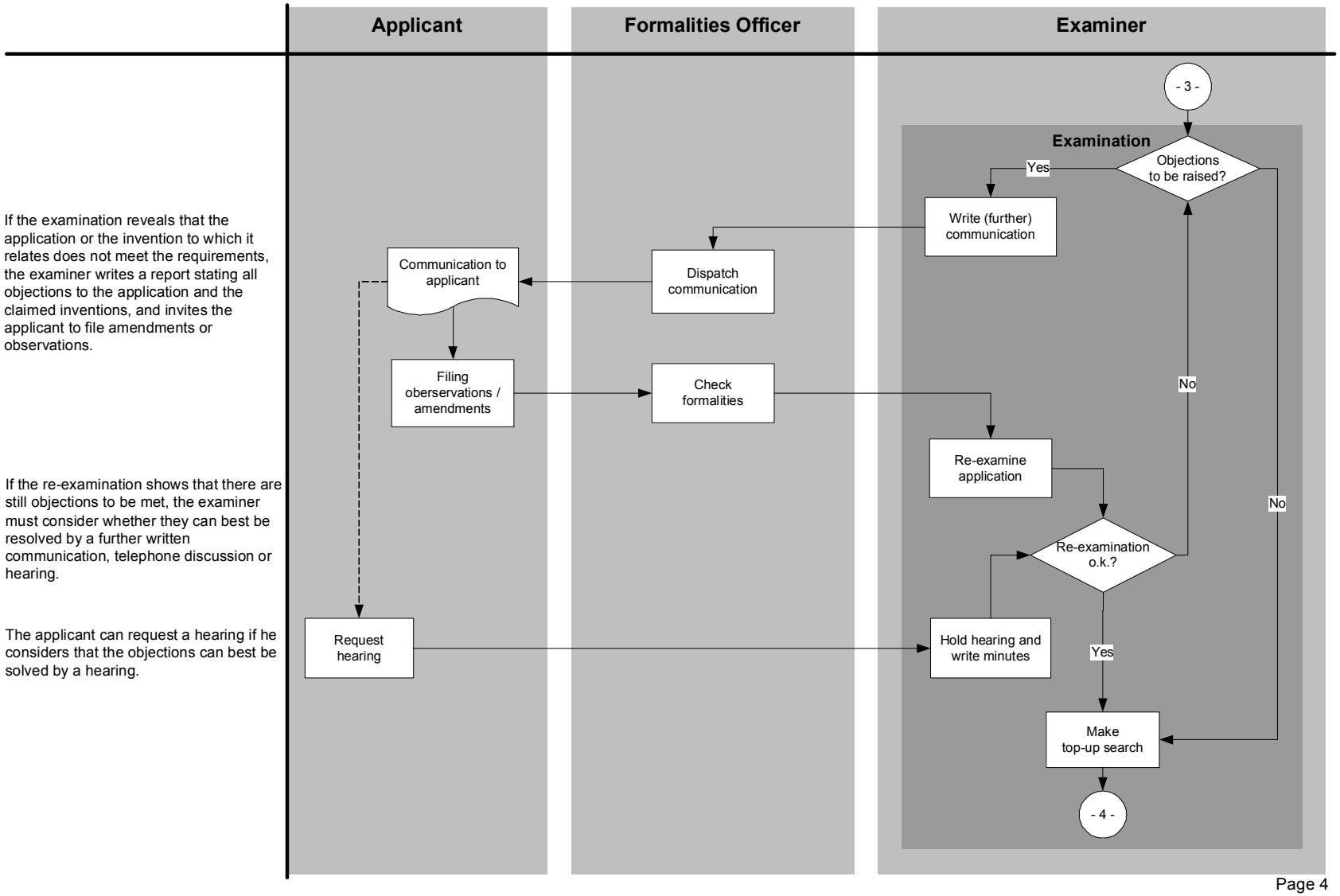


The examiner selects from the documents retrieved the ones to be cited in the report and prepares the search report with reference to the specific claims (and in addition an opinion on whether the application seems to meet the requirements.)

DPMA: no opinion
UKPO: opinion not for all cases

The examiner's first step is to study the claims of the application, concentrating on any amendments and/or comments filed by the applicant in response to the search report/opinion.

Generic Patent Granting Process for all offices



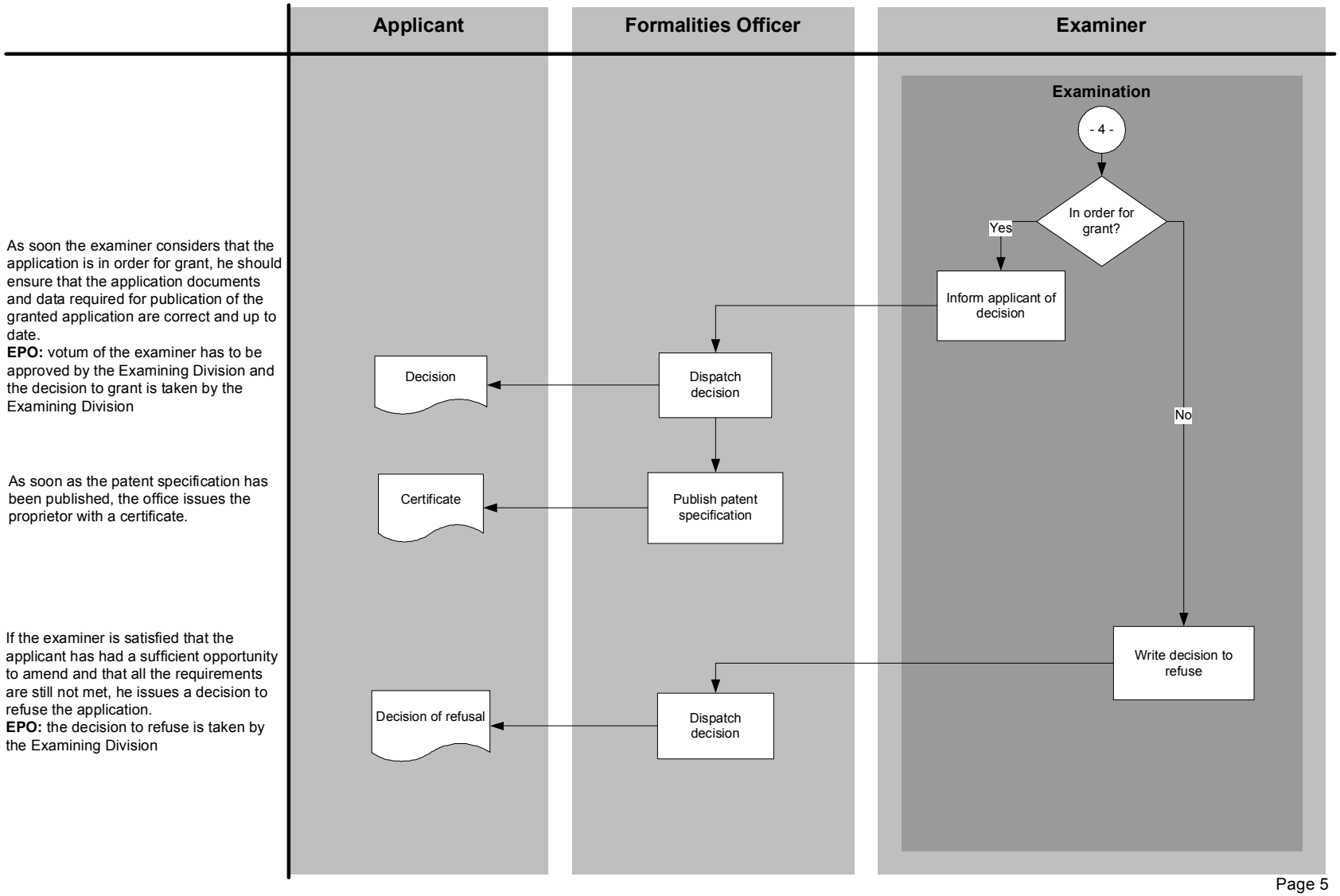
If the examination reveals that the application or the invention to which it relates does not meet the requirements, the examiner writes a report stating all objections to the application and the claimed inventions, and invites the applicant to file amendments or observations.

If the re-examination shows that there are still objections to be met, the examiner must consider whether they can best be resolved by a further written communication, telephone discussion or hearing.

The applicant can request a hearing if he considers that the objections can best be solved by a hearing.

Page 4

Generic Patent Granting Process for all offices



As soon the examiner considers that the application is in order for grant, he should ensure that the application documents and data required for publication of the granted application are correct and up to date.
EPO: votum of the examiner has to be approved by the Examining Division and the decision to grant is taken by the Examining Division

As soon as the patent specification has been published, the office issues the proprietor with a certificate.

If the examiner is satisfied that the applicant has had a sufficient opportunity to amend and that all the requirements are still not met, he issues a decision to refuse the application.
EPO: the decision to refuse is taken by the Examining Division

Page 5