How the Patent Pendency Model Works

Overview:

The Patent Pendency Model (PPM) is part of the USPTO's ongoing effort to be more transparent to the nation's innovators and the American public about the factors that impact pendency. Reducing patent pendency is the Agency's top priority, and the Agency has already implemented a series of efficiency initiatives, including the revised examiner count system and compact prosecution, that are designed to reduce pendency and improve quality.

The PPM uses historical data to create graphs that estimate first action pendency and overall pendency periods based on certain key variables. The PPM enables users to forecast pendency annually, through 2016, using a combination of inputs including: (a) the number of examiner hires per year; (b) the amount of overtime worked; and (c) patent filing levels. For example, the PPM shows that if the USPTO were to hire 250 examiners in FY 2010 (the FY 2010 budget hiring allocation) and 1,000 examiners per year in each of FY 2011 and 2012 (the FY 2011 budget request hiring allocation), the patent application backlog could be reduced from the end of year FY 2009 level of nearly 720,000 to just over 530,000 by the end of FY 2012. (Please note that the numbers in the light green section are based on current agency projections.)

The PPM demonstrates that, even if all of the efficiency initiatives are fully successful, the Agency will be unable to appreciably reduce the backlog and shorten patent pendency without increased targeted hiring and overtime.

While this type of model has been used at the USPTO for planning purposes since the 1980s, we are now making it available to the public. Please understand, however, that the model has some limitations. Some of these limitations stem from the uncertainty of the environment - for instance, the model cannot account for unforeseen court decisions or fluctuations in attrition and filings due to a change in the economy. But there are other opportunities available to improve the model by including more sophisticated modeling techniques.

We are currently working to improve the model, and we invite any user comments regarding possible future improvements. **We ask that you send an email to PatentPendencyModel@uspto.gov with such suggestions.**

Model Components:

The model has two basic components -- staffing levels and application output per examiner.

Staffing Level Projection:

The staffing portion of the model starts with the current staffing levels of all examiners at each grade level, from GS-5 to GS-15. At the end of FY 2009, the Agency had a total of 6,143 examiners. The breakdown by GS level is as follows:

GS-5	GS-7	GS-9	GS-11	GS-12	GS-13	GS-14	GS-15	Total
112	588	844	889	1014	809	1843	44	6143

These year-end FY 2009 examiner staffing levels were used in projecting our total examiner staffing for FY 2010. Based on historical data for the past three years, we then estimate the number of hires or number of attritions per GS level. We add in the hires for a given year to the appropriate GS level. The same is true for the attritions. We use past years' ratios of attritions to predict a certain number of attritions at each grade level (6 percent of our attritions are GS-5, 24 percent are GS-7, and so on) and subtract them from the total staff number. We also have a promotion ratio from past years, and we adjust the examiner numbers in each grade level based on the amount of examiners we predict to be promoted. This gives us a baseline number of hires, as shown above, as well as a projected total staff at each GS level for the end of that fiscal year. Then we take an average of the beginning of fiscal year number and the end of fiscal year number and come up with a "Total Staff" for each grade level for that fiscal year.

Application Output per Examiner:

Once we establish staffing levels for each grade level, we use that information to estimate examiner output of applications. We run reports on the previous year that tell us the average number of applications an examiner in each grade level completed (e.g., in 2009, the average GS-5 did 30.4 applications; GS-7 did 40.5, and so on). Once we know how many examiners we will have in 2010, we can simply multiply the staff projection number by the average number of cases and get a total number of applications done by each grade leveled examiner. We then add the totals for each grade level to acquire the total projected application output for the USPTO.

Now that we have the output from the examiners, we have to take the predicted input (filing rates and RCE percentage, projected at 456,000 in 2010) and backlog at the beginning of the fiscal year (718,835) then subtract the projected output, which then gives us our projected backlog at the end of the fiscal year.

This process is simply repeated for all the out years (2011-2016), using the outputs of the 2010 portion to feed the inputs for the 2011 portion, and so on.

Future Enhancements to the Model

We are currently exploring future improvements to the model, including:

- Creating a version of the model that takes account of differences in individual Technology Centers, incorporates that information, and creates eight smaller models that feed into a larger summation. This will allow for more detail and accuracy given the wide rage of output differences between technology areas.

- We will also consider additional historical data and the dynamics of input and output relationships to determine if it is possible to further improve model performance. For instance, the application output variable in the current model (row 171) is linear and static, since it simply reproduces the previous year application output per GS level and uses that figure or its variance as a prediction for the next five or six years. This number can vary greatly depending on certain situations. For instance, when we hire a great number of examiners, that average number of applications an examiner does decreases due to the training and learning process for all examiners. In years there is less hiring the average number of cases increases. We are looking into making this variable dynamic, allowing it to change based on the factors in the inputs, using trends from the previous 5 to 10 years. Taking account of non-linearities in these predictors may help us to improve the accuracy of the model.

We would appreciate any feedback or suggestions with regards to the model and how we can improve it. We ask that you send an email to PatentPendencyModel@uspto.gov with such suggestions.