Most cost comparisons start with the manual counting tray as the standard technique. This is certainly the least expensive technique in terms of the capital equipment involved. It is also probably the least desirable technique from both the pharmacy and the pharmacist's point of view. The pharmacy would like to see the counting accuracy go up, and the cost of filling a script go down. The pharmacy would like to see transactional integrity improved through the use of better technology (things like barcode based transaction verification). The pharmacist would like to be relieved of the tedious and fatiguing job of manual counting. The pharmacist wants transactional integrity improved without added complexity.

The specifications for manual counting are something like this: (all times in seconds)

1. Obtain the next label packet. t = 2sec.
2. Obtain an appropriate vial. t = 2sec.
3. Put proper label on customers vial. t = 2sec.
4. Obtain the proper supply bottle to the work station. t = 10sec.
5. Scan the supply bottle. t = 2sec. Note: Steps 5 and 6 only required for verification
6. Scan the label pack or the customers vial. t = 2sec.
7. Wipe the counting tray clean. t = 1sec.
8. Open the supply bottle and pour an adequate number of pills on the tray. t = 5sec.
9. Separate 5 pills with counting stick and sweep into customers chute. t = 2sec.
10. Repeat step 5 until required quantity is in customers chute and close cover. t = as required [(N-1) x 2sec], where N = # of pills for script / 5
11. Sweep excess pills into return chute. t = 1sec.
12. Pour excess pills back into supply bottle and recap. t = 2sec.
13. Pour script pills into the customers vial. t = 1sec.
14. Pharmacist's inspection and cap vial. End transaction.

If we recognize that steps 1 through 4 are required for everything but complete robotics we can set those times aside in our comparisons.

Counting Manually
Let's take our average script to be 40 pills. This means N = 40 / 5 (5 pills per sweep) = 8sec.
Time per script done manually (steps 5 through 13) =2+2+1+5+16+1+2+1 = 30sec.

Counting by Weight
(Next lowest capital investment) as done on Torbal DRX500SX workstation for the same 40 pill average script:
Steps 1 through 6 are identical.

7. Place customers vial on weigh pan. t=1sec.
8. Press the Tare button to tare the vial weight. t = 3sec.
9. Pour 40 pills into customers vial (while watching the count down display) t = 11sec.

10. As described in step 14 above.

Time per script done on a Torbal DRX500SX workstation scale (steps 5 through 9) = 2+2+1+3+11 = 19sec.

However, we must add to this the overhead of updating the average piece weights (APW) of every drug in the formulary (that is counted) once every 30, 60, or 90 days (automatic reminder by scale). When done while filling a script, added t = 6 sec. If active formulary of counted pills = 1500, then add 1500 x 6 = 9000 seconds over 30 days (for a very accurate APW database). Lets assume in 30 days the pharmacy fills 30days x 200 scripts/day = 6000 scripts by counting, then the added (overhead) time to update APW is 9000sec / 6000 scripts = 1.5 sec per script.

This makes the total time per average script = 20.5sec

Net savings = 30sec. – 20.5sec. = 9.5sec per average script
Total time saving for 30 days = 6000 scripts x 9.5sec/script = 57,000sec = 950min = 15.8hr. If burdened labor is $60 / hour, then cost savings = $948 per month.

Counting by Electro Optics
Using a hopper fill device, with a common counting path, for the same 40 pill average script:
Steps 1 through 6 are identical

7. Pour pills into hopper (while watching the counting display) t = 8sec.
8. Remove over count from receiving tray and replace in supply bottle and replace cap. t = 3sec.
9. Pour pills from receiving tray in to customers vial. t = 2sec.
10. As described in step 14 above. (Pharmacist inspection).

Time per script done Electro-Optics (steps 5 through 9) = 2+2+8+3+2 = 17sec

However, we must add the overhead time required to clean the machine in order to avoid miscounts and cross contamination. Time per cleaning = 240 sec, should be done approximately every 100 scripts, or 2x per day in our 200 script per day pharmacy. The overhead time then = 2 x 240sec = 480sec / day, which becomes 480sec/day / 200 scripts/day = 2.4sec / script. This makes our total time per average script = 17+2.4 = 19.4sec.

The net savings over manual is 30 – 19.4 = 10.6 sec/script
Total time saved for 30 days = 6000 scripts x 10.6sec = 63,600sec = 1,060min = 17.7hrs.
If burdened labor is $60/hr, then the cost savings is 17.7hr x $60/hr = $1,060 per month

Counting with Cell Banks
Using a cell bank system without robotics for vial filling, for the same 40 pill average script:
Each cell, of which there may be 60, 100, 200, or other, contains one specific drug and has its own counting device. These cells are used for the most popular drugs (that can be counted), and require frequent refilling depending on the pill capacity of the cell, which in turn depends

upon the pill shape and volume. In some cases the cell will not hold a full day's inventory, in other cases it may hold over a month of inventory. The pharmacy must manage the inventory properly or it will find its inventory value is much higher than with other simpler systems.
In these systems the PMS (or equal) associated with the pill counting device must download the script information to the counting cells. An operator must bring a labeled customer vial to the pill bank and scan the label at a station on the pill bank. At that point the operator goes to the pill bank where only one pill cell identifies itself, and the operator positions the vial for filling.
Let's try assembling the steps:
Steps 1 through 3 are likely the same (prepare a labeled vial)
Steps 5 and 6 are essentially the same

7. Place the vial under the proper cell and press to start the filling operation. The script is pre-dispensed on some machines. t = 10 sec (including the scan, the walk to the cells, finding the right one, waiting for the fill, and the walk to the inspection station). This is an optimistic estimate with wide margin.

Time per script done on cell banks = steps 5 through 7 = 2+2+10 = 14sec
However, we must add the overhead of time spent filling and cleaning cells. This obviously varies widely with the cell design and the particular pill being counted. We know that these cells count the most popular drugs and will see a lot of traffic (which the manufacturers rely upon in their cost justifications) but we do not have sufficient information for an enlightened estimate. If we assume that the 200 script per day pharmacy manages the inventory so that 15 of the cells are filled once every day, and that a cell takes 30 seconds to clean and 30 seconds to fill. In a 60 cell machine this means 15 cells x 30+30sec = 900 sec per day. If this cell bank does 200 scripts per day the overhead is 900sec / 200 scripts/day = 4.5sec per script.
This makes the total time per average script equal to 14 + 4.5 = 18.5sec
The net savings versus manual counting is 30 – 18.5 = 11.5sec/average script
200 scripts/day x 11.5sec = 2300sec/day, 30 days x 2300sec = 69,000sec/mo =1150min/mo = 19.2hrs/mo. At $60/hr this means 19.2 x 60 = $1150/mo

All of these examples are designed to allow you to modify the data with your actual numbers and replace our estimates with yours if you know more, or think ours overlook factors. Remember that what we show is the time saved by automating, whether or not that time can effectively be converted to money or just put to better use is up to the pharmacy. We hope that we have enlightened rather than obscured, in an area where information is valuable.