In Part 2 of this series we analyzed 4 of the 5 Items that contributed to the time spent filling a prescription manually. Two of these items could not be reduced, Item 5, the Pharmacist's inspection, and Item 3, delivery of the finished script to the pickup area (only because no one does it). Several full robotic units handle Item 4, the vial selection and labeling chore, and we estimated they saved 7 seconds out of 8 seconds (another estimate).

A number of units, which we called the parallel cell types, reduce the amount of legwork and time spent on Item 2, fetching and returning supply bottles to storage areas. The total time to be saved here is significant (estimated at 16.4 seconds typically) and the technique of loading drug supply bottles into individual drug cells does reduce this time. However, the amount of time saved varies from drug to drug (the quantity that can be stored depends on drug shape and volume), how long it takes to load the cell, what type of book keeping is required, and cell characteristics vary from supplier to supplier. We sort of rationalized our way to a savings of 11.6 seconds out of a total available of 16.4 seconds.

Now for Item 1, pill counting, which we estimated at 36.9 seconds for the average script that is filled by counting manually. This is the area where automation really makes a difference. The full robotic units, where the script is handled from empty unlabelled vial to finished script delivered to an inspection station, handle this item completely and save the entire amount of time. However, their cost and complexity is such that they can only be justified for use on the top 200, or so, drugs, and even then only in pharmacies that handle very large numbers of scripts. These systems almost always have a direct interface with the PMS.

What about a non-robotic parallel cell counter? Here the operator starts with a labeled vial and walks to the cell banks, scans the vial label and the unit indicates which cell is going to dispense the scripted drug (sometimes by blinking LED, sometimes by directions to a cell location). Some cells have a separate chamber in which they can store a pre-dispensed script which can eliminate the need for the operator to stand at the cell while the script is filled. However, even here the scripts can only be picked up serially in order to avoid disasters where the wrong script is put in a vial. The drug can be verified by scanning the cell label and comparing it with the vial label. These units should save time over counting manually, but how much is not obvious.

The units which are capable of pre-dispensing can save the time the operator would otherwise have to spend waiting while the script was counted out. However, the time required to walk to, and from, the cell bank, and to find the proper cell, must be added into the script time. Perhaps these units can save 22 of the 36.9 seconds = 14.9 seconds. The units that require the operator to stand with the vial under the proper cell until the script is counted out save less time, perhaps 10 of the 36.9sec = 26.9 seconds.

The pill counting scales, the hopper fed electro optical units, rotating table units, and the optical target identification units all use a workstation approach, just like manual counting. Only the scales share the non-cross contamination characteristics of the parallel cell approach. All are faster than manual counting. The scale saves about 20 of the 36.9 seconds, but puts 2 back to do verification, and 1 to update its APW library. Net savings is 17 sec from 36.9sec = 19.9 seconds. The hopper fed electro-optics units require an unspecified amount of cleaning time, to both prevent counting errors and avoid cross contamination. The other units seem to talk about 120 to 150 scripts per hour, or 24 to 30 seconds per script. Only the scale is capable of counting all of the pills in the formulary, and is capable of 180 scripts per hour. The supplier of the optical target ID system indicates it can save about 23sec of the 36.9sec = 13.9 seconds, or 259 scripts per hour. The unit is a cross contaminator, but is quickly and easily cleaned.

However, all of these workstation type units do not reduce the time for Items 2 thru 5 and, therefore the overall per script time reduction is from 80.3 seconds (a smaller percentage in overall script time). Let's move on to Part 4, where we try to make sense of all of this.