

**New POS transaction system proposal
as part of the DRC's FY'08 Annual Work Plan**

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I would like to describe my new Point Of Sale (POS) transaction system proposal for the DRC. I would like to implement changes on or close to July 1st, 2007. Changes proposed in this proposal go hand in hand with changes proposed in Appendix C billing changes.

The basic purpose of the POS system is:

1. Create a better record of a customer's use by weighing all waste and recyclables that a customer delivers. Waste items too large for our scale would use our existing volume based billing schedule.
2. To make it easier for the operator to log or write down which customer is bringing in what materials by automating this processes to the greatest degree possible.
3. To better inform customers as to what their daily charges are and what their account balance is.
4. To treat all business customers the same.
5. To make it so that the City Clerk can access the DRC database, via a web interface, to query customer balances and enter in customer payments.

The need:

The present system is difficult for the operator to keep up with when there are many customers at the DRC at one time, as it can be difficult to keep up with writing down or logging all of the transactions, one customer may have three categories of materials to log for example. Customers are not aware of their balances unless they ask or are told by the operator who themselves would have to look the information up. This lookup process discourages the retrieval of account information and can make the operation that much slower.

The present system does not allow for a real time connection to the database for the operator. Presently a customer balance spreadsheet is kept on hand at the DRC (either printed or on an old computer) this a reference as to what each customer's balance and annual fee status is. During the day the operator writes all the customer transactions on a log form and I later enter these transactions into the database, run a query and update the customers balance spreadsheet which then must be taken back to the DRC (as my office is not at the DRC...).

The present system also requires careful coordination between myself and the City Clerk. Presently I do all the billing for the DRC but most of the payments go to the Clerk. The Clerk has no way of knowing what a customers balance is and no way of updating the DRC's database when a customer has paid their bill. It is up to myself and the Clerk to constantly compare my billing statements and her checks received to determine who has paid their bill and who has not.

The proposal:

The new system I propose is one that is similar in style to the point of sale system most stores use except that rather than establishing a customers identity and charges at check out time the customer will be identified and charged at check in time. While the customer will be charged for

the weight and composition (disposal/ recycle) of what they bring in at the beginning of their visit, they will still be responsible for sorting their own recyclables into the proper receptacles. One of the unique twists in the DRC's POS system is that it's interface will be based around a common web browser such as Firefox or Internet Explorer rather than a interface designed around a particular machine. A big advantage of this approach is that it allows access to the database from anywhere on the network that the database is connected to. Initially this network will just be the computer terminal at the DRC but can be upgraded to connect to GCN with the final goal, when all security concerns have been addressed, to be accessible through the Internet. This will allow the City Clerk to access the database.

Changes needed will be:

1. All items must be weighed on the digital scale. As mentioned previously items too large for the scale will be charged using a volume charge. The customer weighs their goods, either pays in cash/ check or accepts the charges to their account, is handed a receipt and then goes about sorting their recyclables. This operation will be made as quick as possible so a bottle neck does not form around the scale. The DRC has purchased, as part of our most recent Denali grant, 13 plastic stackable totes that customers can place their sorted or unsorted recyclables prior to using the scale in an effort to make their time on the scale as short as possible.
2. Customer identity card. Each customer who has an account on file with the City will be issued a plastic card with their ID number in barcode format printed on it. These are simply blank credit card sized cards that we then affix a preprinted barcode label onto. We can print our own barcodes with either the new receipt printer or the new Laserjet printer. Customers can opt to leave their cards in a special area of the DRC for use when they come in (so they don't forget them). A customer's name can always be typed in manually on the transaction terminal as well. Cash customers who do not have an account will simply use the "cash" name account.
3. Set up of a transaction/ data entry computer, digital scale interface, receipt printer and optical wand for scanning customer's ID card. Equipment for this new setup is inexpensive and is listed in the Annual Work Plan and budget narrative. The challenging part of this will be in getting the new equipment to talk to one another. I have my hopes and I have some familiarity with RS-232, the serial digital scale and receipt printer interface, and USB, the optical wand interface. Incompatible data and equipment protocols could become a major stumbling block in this project.
4. Set up of new POS and barcode generating software. Data from the transactions will be processed by this new POS software program. This new program will interface with the existing DRC MySQL database. This program will determine if the customer has an account or good credit, what their charges are, update their balance and will print them a receipt if desired. I will be writing this program.

This computer listed above is not in the budget because for the first year of this service an existing used computer will be used. If the new system is made to work a special cabinet will have to be constructed so the transaction computer can work in a reliable fashion during the winter months (since there is no heated office I will need a heated cabinet). If this system is successful there will probably be a request for a new computer in the FY'09 budget.

There is already a custom billing program in place for the DRC: "billing_statement-0-9-3.plx" is the present version this program that I have been using since last November. I wrote it in the Perl programming language. It asks the user whom you want to query, the start date, stop date and whether you want a printed statement. I have included a screen shot of this program: [billing_command_line.png](#) and an example of the resulting statement: [Berry+Gabriel—Paul__2007-3-12.pdf](#) Had I owed money there would be a third page which is preprinted with the City's billing address, my account name and \$ amount that I owe for sending with a check to the Clerk. There is not a batch mode feature for this program yet where you generate a batch of bills in one run but it is in the works.

As soon as possible a wireless link will be established between the DRC and GCN. If successful this will allow the database to be available 24/7 on the Internet for administration (by me) and be accessed by the Clerk for billing purposes that I mentioned earlier. Hopefully an antenna in a tree will link the DRC to the Salmon River Network. If that does not work it maybe possible to use a modem/ phone connection to synchronize the main server located with GCN's equipment with a slave server located at the DRC. Any changes made during the day would then be uploaded at the end of the day.

The POS software I am proposing to base our new system on is: PHP Point Of Sale 9.1 www.phppointofsale.com. The barcode generating software I am proposing to use is Kbarcode-2.0.5, www.kbarcode.net Other open source POS systems I have looked at are EasyPOS <http://easypos.sourceforge.net> , LanePOS <http://l-ane.net/> and gShop <http://gshop.sourceforge.net/> there are more... I referenced these programs to give people an idea of what it out there and where I am getting my ideas.

All software used in this project will be "open source" similar to the Perl language that I used to write the billing program I mentioned earlier. The MySQL database software that I have been using since last August for all of the DRC's customer and transaction information is also an open source software program. Open source software is available at no cost. Typically the people and organizations that produce open source software charge \$ for consulting services related to their programs as these programs can be very complex. By way of reference MySQL is a very common database management system with over eight million installations world wide and 40,000 downloads every day. Businesses such as Yahoo and Google and many ISP providers such as GCN use MySQL. Open source is now a substantial movement within the software industry and there is a lot of good software out there written by some very talented programmers.

Open source software does include a license for it's use. The license used by most open source programs is the GNU General Public License. It states that when I modify any software I have downloaded and released (by posting it on the Internet or other wise distribute it) I have to license my work under the same GNU General Public License.

I have included links to screen shots of programs or interfaces that I wrote and am presently using as part of my work at the DRC.

Re-inventing the wheel?

There are commercial packages available for landfill management (scale operations, customer billing, equipment maintenance tracking etc.). Generally the operations they are made for are much, much larger than ours with routing software for efficiently managing a fleet of trucks. Some packages are modular however so you can avoid buying and installing packages that you do not need. While I was attending Waste Expo in Las Vegas during April of last year I had the opportunity to speak with several vendors who supply such systems. They are expensive, probably on the order of \$5,000+ for a good setup customized to our needs, but they are very impressive and come with support (for a fee). Probably the company I liked the most was www.ParadigmSoftware.com . Another I heard good things about was www.ricsoft.com. However these systems are all proprietary and cannot be modified by the end user like the open source programs that I am most comfortable using. They also do not use MySQL as their database and do not work on the Linux operating system. Proprietary software would result in the DRC being tied to a particular vendors product. It should be noted that all of the software I am proposing to use for the new POS system will work on either the Windows or Linux operating system and with enough tinkering be adaptable to work on a variety of commonly available hardware. This is one of my goals in this project, to make a reliable system that uses common open source software packages on commonly available equipment. With the additional advantage that it can be easily adapted to new equipment and needs.

Conclusion

Mostly I want the challenge of using my computer software skills to set up this new system. I have been dabbling in computers and writing software programs as a hobby for over 25 years. I have not setup a system like this before but I am aware of the hardware, software building blocks and programming languages that comprise such a system. If I cannot make the new POS system work our existing hybrid paper/ electronic system will still be in place and I will be better educated when I prepare to write an RFP to the various vendors I mentioned in the previous paragraph for a POS package for the DRC that will do what I want. The equipment I am proposing to purchase as part of the POS system is not expensive and could be used for other purposes. The only resource I do not want to exhaust is the patience of the DRC's customers or operator so I will work to make these changes as painless as possible for them.

If this system is successful, which I believe it can be, part of my job will be to document the software, interfaces and equipment the system uses. This will allow for administration of the system in my absence and provide information for trouble shooting the system if it is not working properly or installing and reconfiguring it on new equipment.

I want to note that all of the time I spend learning about the programming languages I use and the open source programs that I am basing our system on, is done on my own time. All books that I purchase to learn about writing computer programs (about 1 or 2 a month) I purchase with my own funds. I only charge for my hours when I am actually applying the software to the DRC or maintaining an already running software program. I appreciate this opportunity to create a unique open source software system and I hope the Council will support me in this endeavour.