

Paper 054-2008

## Using SAS® and Microsoft Office to Deliver Organizational Metrics

Neil Reitmeyer, International Business Machines, Fishkill, NY

### ABSTRACT

Email is an effective means of pushing critical metrics into the hands of key decision makers. An organization's ability to get value, and knowledge, from these metrics could be the difference between just surviving and thriving. Utilizing SAS® Enterprise BI Server, SAS® Enterprise Guide®, SAS Stored Processes, and the SAS Add-in for Microsoft Office, organizational metrics can be easily packaged in Microsoft Office documents, automated, and distributed.

Microsoft Office is recognized as the industry standard for business presentations, worksheets, and word processing documents. The SAS Add-in for Microsoft Office allows for seamless integration of the organization's SAS data into Microsoft Excel, Word, and PowerPoint. The SAS Add-in for Microsoft Office in conjunction with SAS Enterprise Guide allows the IT department to quickly produce and push information packages to the organization.

IBM's 300mm Semiconductor Fabricator generates six daily automated packages and distributes them throughout the organization. In addition to describing these six packages, this paper will focus on the process for creating and delivering the packages via email distribution.

### INTRODUCTION

The current business environment is extremely dynamic, volatile, and contains terabytes worth of information. It is extremely important for the organization to gain business value, and knowledge, from this data. This information can be effectively managed and turned into vital organizational knowledge by utilizing business intelligence (BI) tools.

Implementing BI software, and systems, could bring a significant positive impact to an organization's daily operations. BI surfaces mission critical information out of the information vortex into mainstream applications such as portals, dashboards, and daily email distributions. BI systems transform fragmented legacy information into a central repository giving the user access to multiple data libraries. These libraries are accessed via one common interface thus significantly reducing the amount of system training.

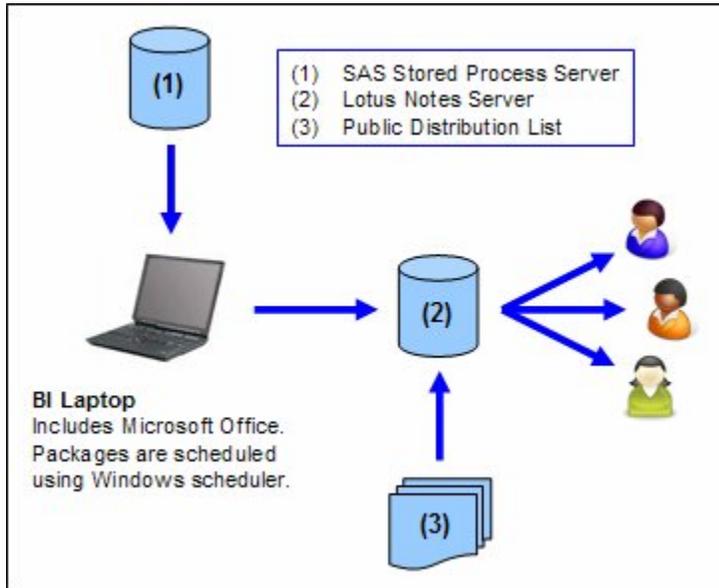
There are key tools that should be included in an organization's BI toolbox which will help the organization effectively manage information. These tools include portals, dashboards, ad-hoc reporting, and email distributions. This paper will focus on the use of BI integration within Microsoft Office and the process for creating the packages and delivering them via email distribution.

Microsoft Office is recognized as the industry standard for business presentations, worksheets, and word processing documents. The SAS Add-in for Microsoft Office allows for seamless integration of the organization's SAS data into Microsoft Excel (Excel), Word, and PowerPoint. The SAS Add-in for Microsoft Office in conjunction with SAS Enterprise Guide allows the IT department to quickly produce and push information packages to the organization.

These packages contain critical business metrics used by key decision makers across the organization. They can be delivered via email, made available via a web address, or produced for the user community for on demand refreshing. The use of SAS Enterprise Guide and SAS Stored Processes allow for quick generation and modification of these packages.

### IBM 300MM PACKAGES

There are currently six Excel packages being generated in IBM's 300mm Semiconductor Fabricator (FAB) using this process. The process includes the use of SAS Stored Processes generated using SAS Enterprise Guide, a laptop containing Microsoft Office and Windows scheduler, a Lotus Notes database, and a public distribution list (Figure 1).



**Figure 1.** Model of BI Email Distribution.

The daily metrics package includes daily FAB metrics used by line management and line technicians (Figure 2). This package is delivered twice daily in Excel via an email distribution. This package provides views with key metrics directly related to the health of the FAB. Similar metrics are grouped in separate worksheets and organized using tabs. The daily metrics package contains 53 graphs which are generated by 14 SAS Stored Processes. The daily metrics package allows line management and technicians to quickly report on how the FAB has run in the past 24 hours and identify any trends that may be occurring over the past 10 days of operations.

Multiple SAS Stored Processes are needed to better arrange the graphs within the Excel workbook. This allows for the graphs to be easily placed side by side in different worksheets and grouped by metric type. Microsoft PowerPoint does allow you to combine some of the SAS Stored Processes because graphs can be more easily manipulated. Excel was chosen for the daily emails because the Active X content contained in the graphs is more easily accessed and gives you the ability to change the chart type, layout, format, and information.

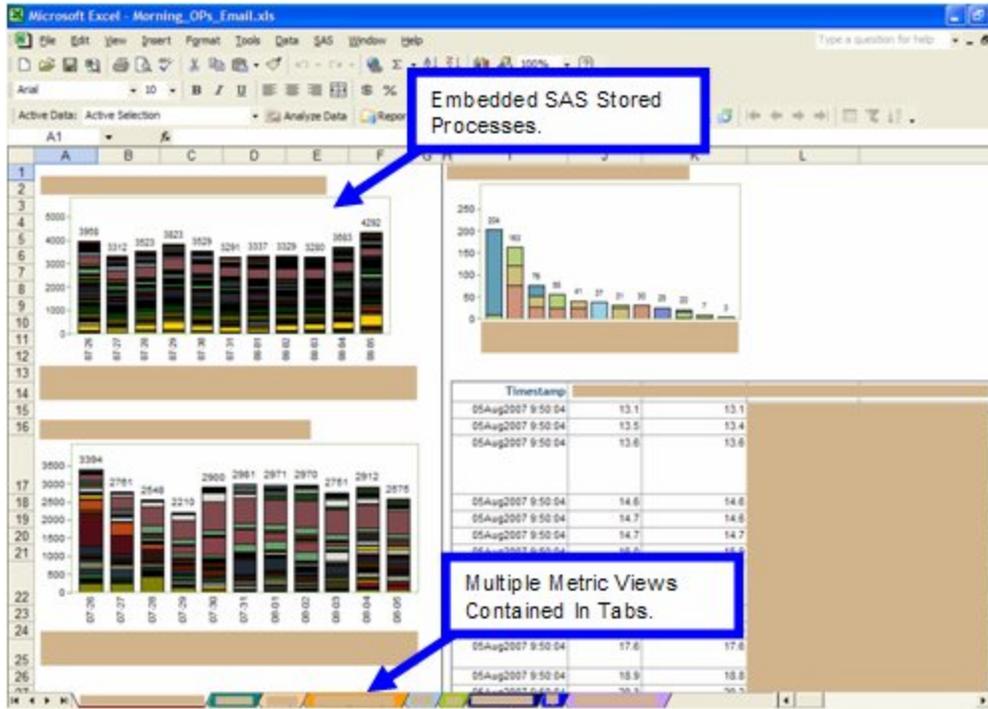


Figure 2. Daily Metrics Package.

The executive package includes daily high level FAB metrics used by project managers and executives (Figure 3). This package is also delivered in Excel and provides views with key metrics to report on the health of the FAB. In comparison to the daily metrics package, this package is generated using 5 SAS Stored Processes and also differs from the daily metrics package because there are no SAS generated graphs. Data tables, which are hidden in the Excel file, are generated via SAS Stored Processes and the graphs are generated within Excel using this data.

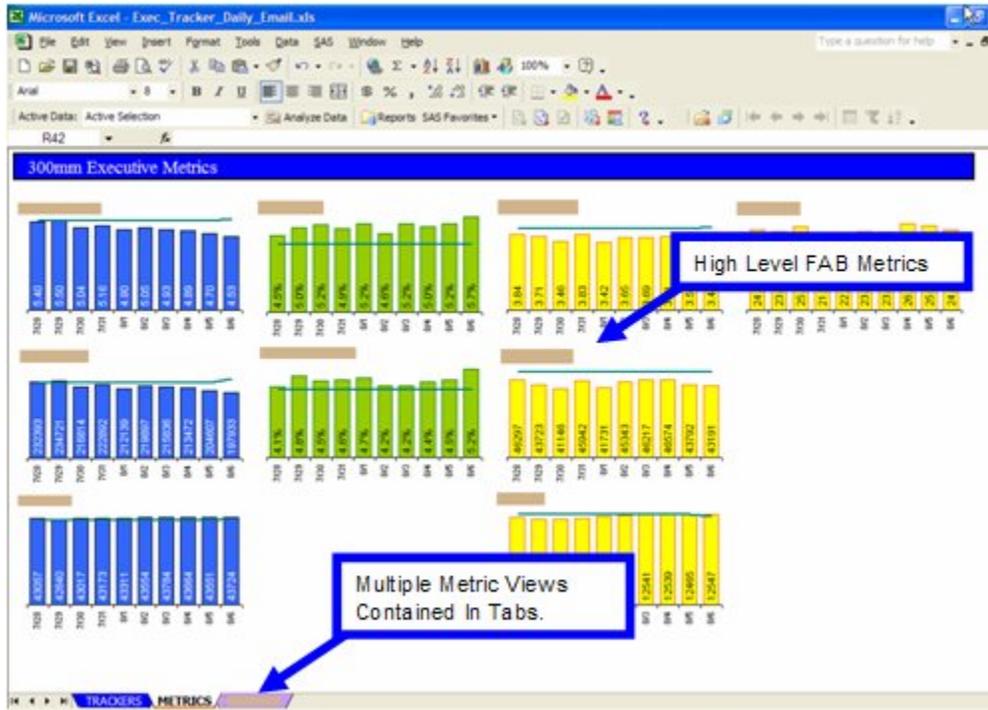


Figure 3. Daily Executive Package.

The method of using SAS tables and generating graphs within Excel has benefits in this package. The majority of the executive metrics do not contain high levels of detail. Generating the graphs within Excel allows for the consolidation of SAS Stored Processes thus reducing the run time and footprint of the package. Excel graphs can be arranged more precisely within Excel and can be quickly modified without changes in SAS Stored Processes code. This package is a hybrid with a SAS Stored Processes backend data surfaced using Excel graphs.

Vendor packages include vendor specific information and allow for this information to be easily distributed to non-IBM vendors without complex authentication schemes (Figure 4). Pushing this package to the vendor also eliminates the need for vendor accounts within IBM and keeps system costs low.

The distribution list is maintained by an authorized IBM to vendor interface person outside of the IT department. Changes to the distribution list are automatically picked up by the Lotus Notes system. Like the daily metrics and executive metrics, this package is also delivered using Excel and contains metrics related to a specific vendor's tooling.

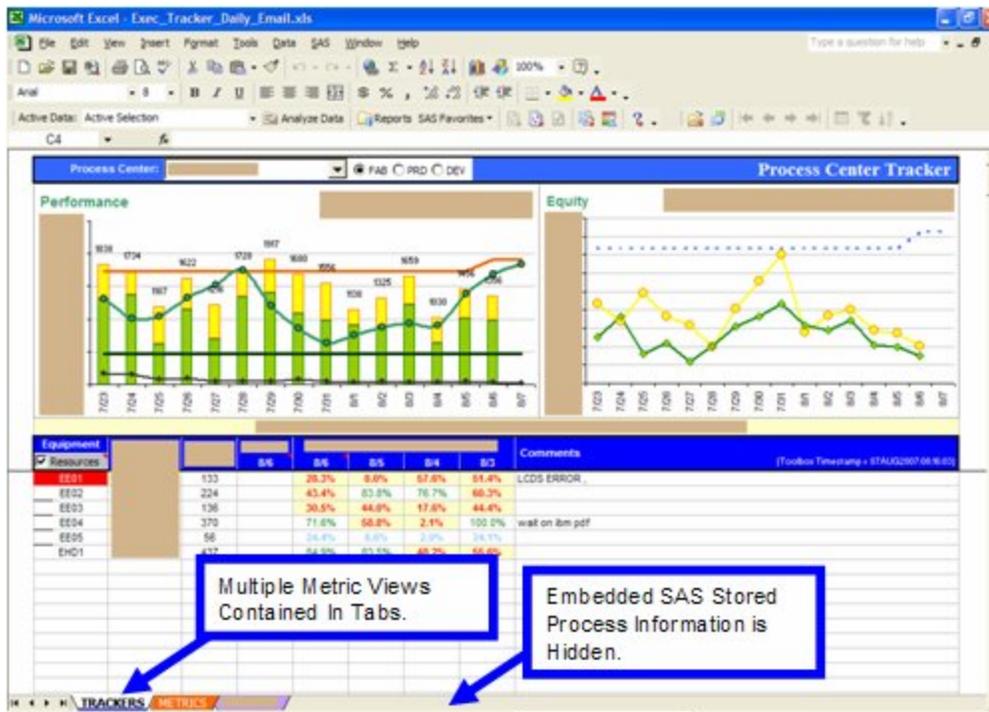


Figure 4. Daily Vendor Package.

## CREATING THE PACKAGES

All of the above packages are generated using SAS Stored Processes and interact seamlessly with the SAS Add-in for Microsoft Office. The SAS Stored Processes are created using SAS Enterprise Guide which allows for quick code generation and easy maintenance of these files. Changes can be implemented quickly using SAS Enterprise Guide and quickly propagated into production using SAS Stored Processes and the SAS Add-in for Microsoft Office. Stored process code is automatically generated from a completed SAS Enterprise Guide process flow by selecting the Create Stored Process option then following the step by step wizard (Figure 5). When created, the stored process can be accessed using the SAS Add-in for Microsoft Office via Excel, Word, or PowerPoint (Figure 6).

If the Stored Process is modified in SAS Enterprise Guide and updated on the server by using the Stored Process wizard, the content will need to be recreated in the Microsoft Office file. This can be very time consuming when you want to make an update to the Stored Process output. You can work around this by copying the code in step #2 of the Stored Process wizard. Manually paste the code into the Stored Process .sas file between the Stored Process generated codes and upload the file to the server.

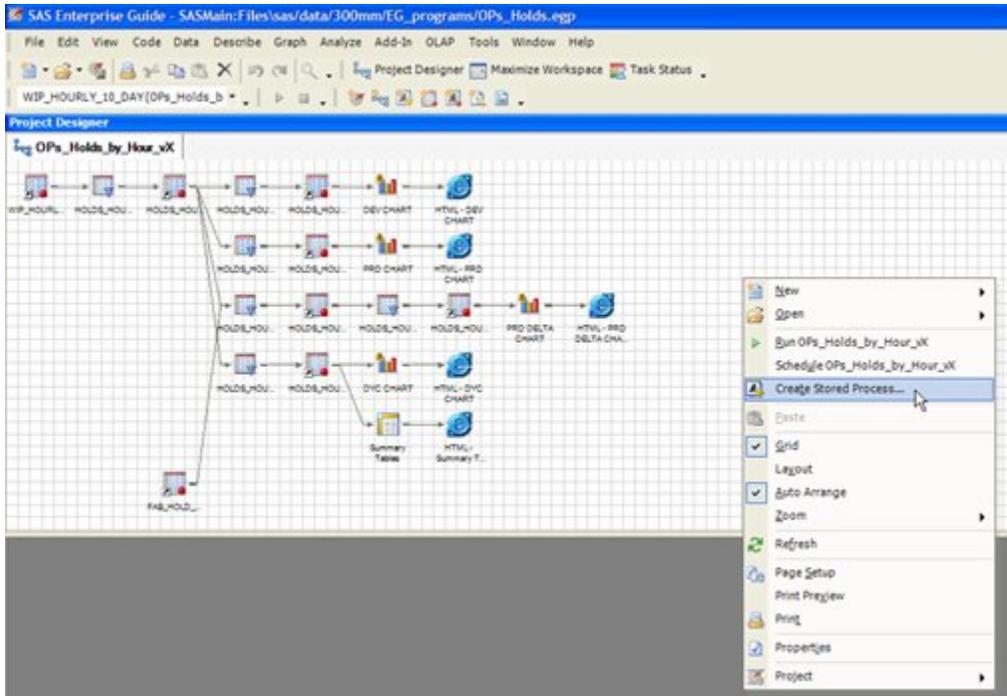


Figure 5. SAS Enterprise Guide Process Flow.

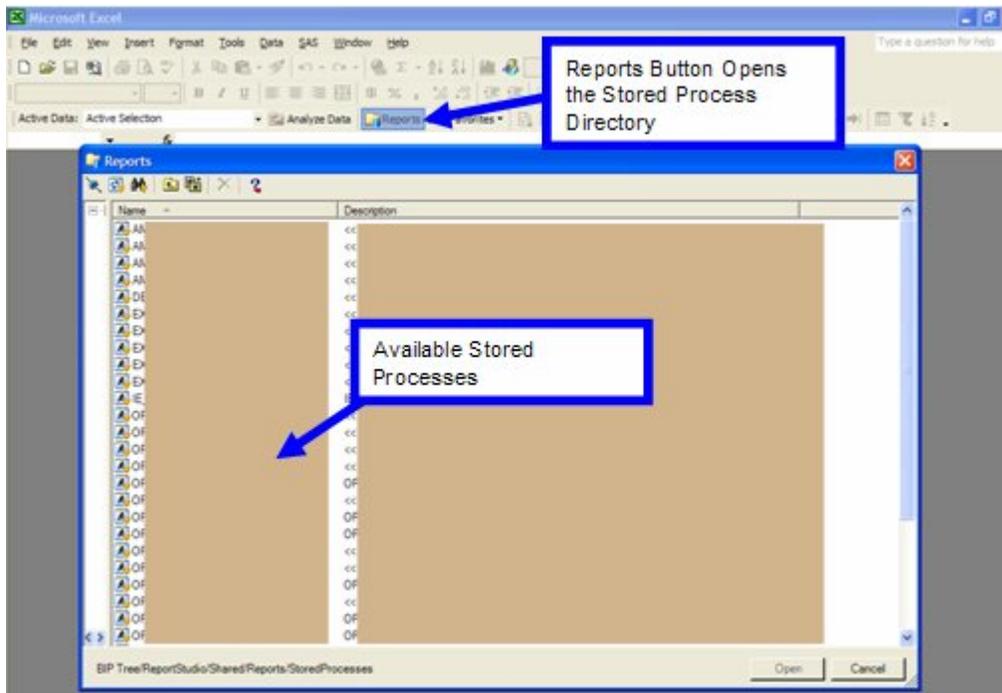


Figure 6. Stored Process Listing.

Completed packages are stored on the BI laptop for processing by the Windows scheduler (Figure 7). Schedules are created within the SAS Add-in for Microsoft Office by selecting the Create Schedule option (Figure 8). The final product of this wizard is a .vbs file which the Windows schedule executes to open Excel, refresh the SAS content, and distribute the file. The .vbs files are modified slightly by the IT department for additional functionality such as FTP scripting and file naming conventions.

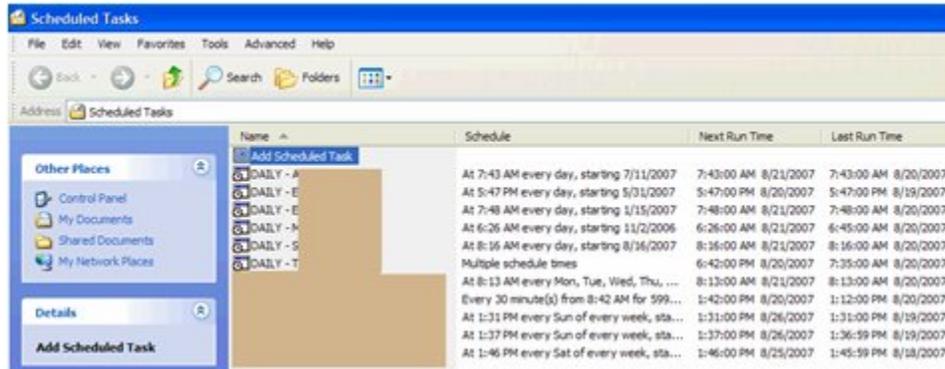


Figure 7. Windows Scheduler.

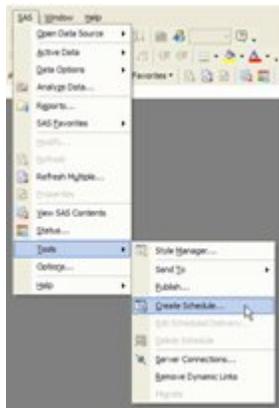
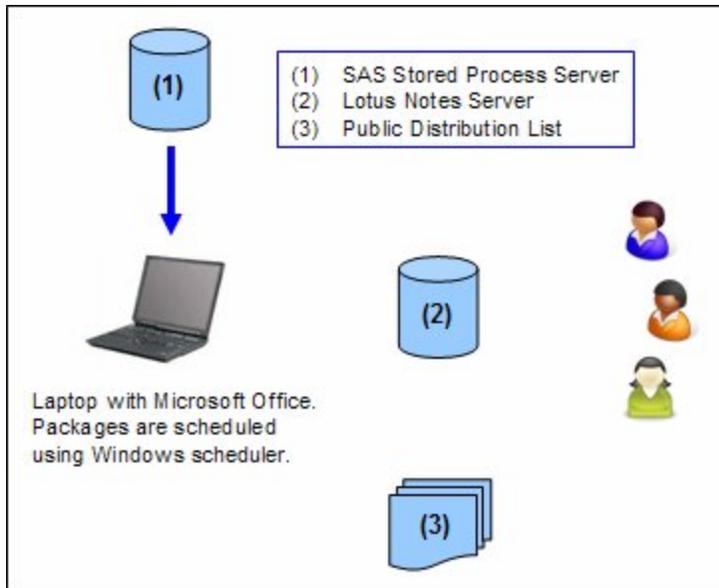


Figure 8. Create Schedule.

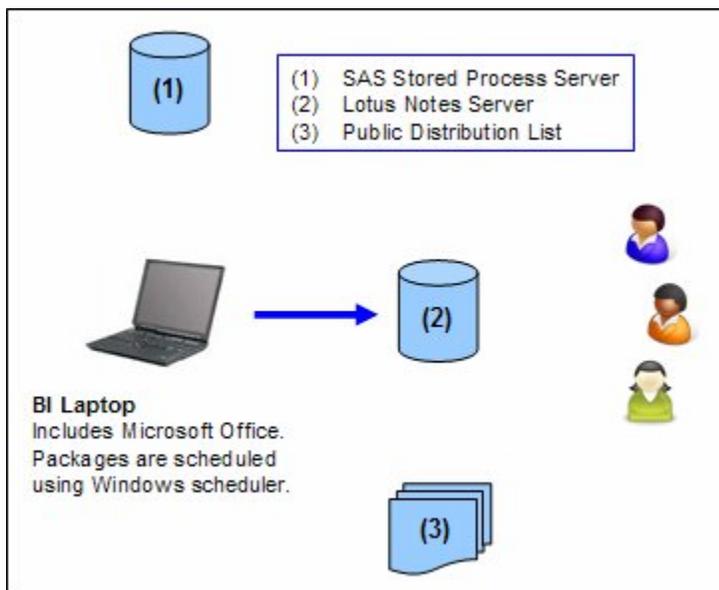
## EXECUTING THE SCHEDULE

The .vbs files are scheduled to run based on the times identified within the Windows scheduler. When instructed by the scheduler the .vbs file executes and calls the stored process server to refresh the SAS content (Figure 9). All the SAS content contained in the Office document will be refreshed at this time and saved to the BI laptop.



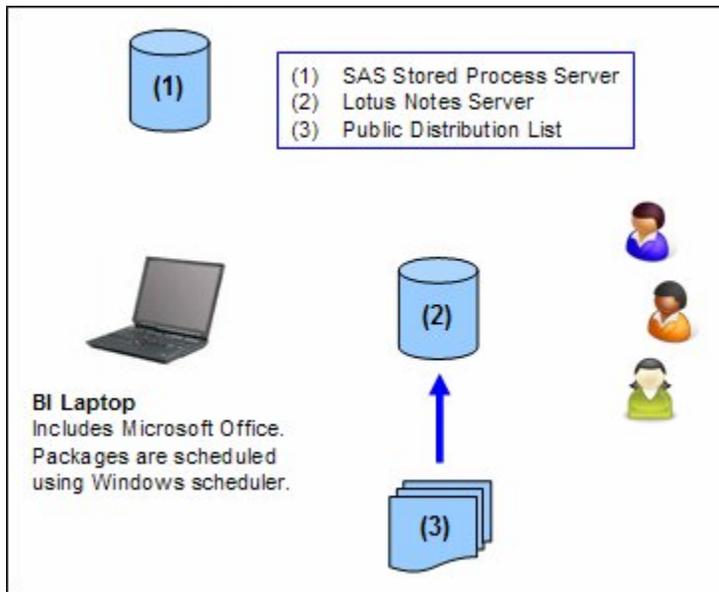
**Figure 9.** SAS Content in the Office Document is refreshed from Stored Process Server.

If the intended distribution method is email, the refreshed file is sent to a Lotus Notes email address for further processing (Figure 10). If the intended distribution method is to a web address, another FTP .vbs script is called to upload the refreshed file to the server. The SAS processing is now complete and the BI laptop is idle waiting for the next schedule to execute.

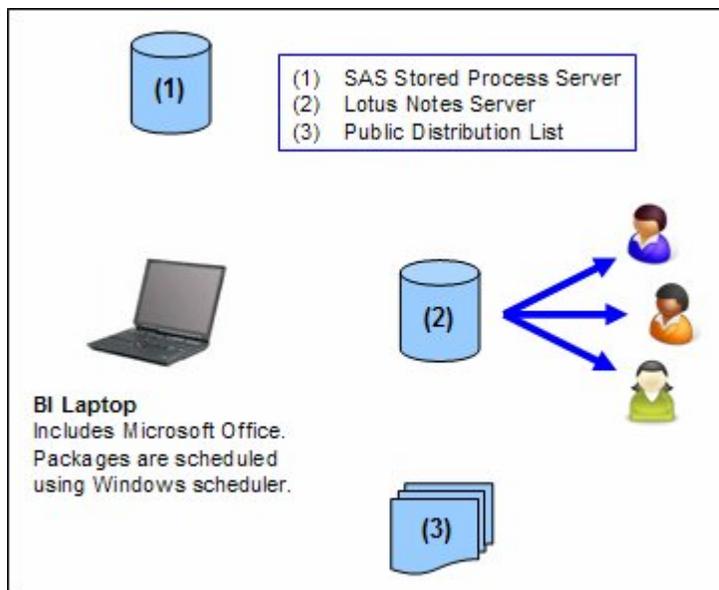


**Figure 10.** Refreshed Document is sent to Lotus Notes Email.

Based on Lotus Notes rules a predetermined distribution list is identified and read by the Lotus Notes database (Figure 11). The email is then distributed to the people listed in this distribution list (Figure 12). Maintaining a public distribution list is the preferred method of controlling the distribution of these files since it can be maintained outside of the SAS and BI laptop environment. The distribution method available within the SAS Add-in for Microsoft Office is cumbersome and must be maintained within the .vbs script. Editing the .vbs script is not an efficient means to add or remove people from distribution. The .vbs scripts used in the 300mm FAB are set to one recipient who passes the distribution tasks to the Lotus Notes system. The current distribution lists used to send these files can exceed 250 people.



**Figure 11.** Lotus Notes reads the distribution list.



**Figure 12.** Package is delivered to customers.

## CONCLUSION

Organizational metrics can be effectively packaged utilizing the SAS Add-in for Microsoft Office and distributed via email. This provides easy access to daily metrics which can be used to make quick and sound business decisions. The method of pushing information to individuals has resulted in a net efficiency gain in the IBM 300mm organization.

The use of SAS Enterprise Guide and Stored Processes empowers the IT department to quickly adapt these packages to the changing business environment.

**ACKNOWLEDGMENTS**

I would like to thank the IBM 300mm Logistics Applications team (Tom Anderson, Nathaniel Lange, Eric Dickstein, and Mike Ciulla) for their dedication, and support, to the EBI platform at IBM East Fishkill. Without their support, this paper would not be possible.

**CONTACT INFORMATION**

Your comments and questions are valued and encouraged. Contact the author at:

Neil Reitmeyer  
International Business Machines  
2070 Route 52  
Internal Mail Drop 44A  
Hopewell Junction, NY 12533  
E-mail: [reitmeye@us.ibm.com](mailto:reitmeye@us.ibm.com)

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. © indicates USA registration.

Other brand and product names are trademarks of their respective companies.