SYSMARK® 2014

April 29th, 2014
Revision 1.0

Revision History:
1.0 – Initial revision based on SYSmark 2014 Version 1.0.0.15

About BAPCo

Business Applications Performance Corporation (BAPCo) is a non-profit consortium with a charter to develop and distribute a set of objective performance benchmarks for personal computers based on popular computer applications and industry standard operating systems.

For more information about BAPCo or a complete list of the current membership, see our website at http://www.bapco.com/.

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1 Introduction

SYSmark® 2014 is the latest revision of the preeminent system performance benchmark series that measures and compares PC performance using real world applications, featuring all-new workloads, support for Microsoft Windows 7, 8, and 8.1 both 64-bit and 32-bit, and a new automatic system configuration manager.

SYSmark 2014 gives commercial and government IT decision makers, media, channel buyers, consultants, and system and component designers and manufacturers an objective, easy-to-use tool to evaluate PC performance across the wide range of activities that a user may encounter.

SYSmark 2014 is designed for those who want to:

- Evaluate and compare desktop and mobile computers for purchase consideration based on system performance and application responsiveness.
- Provide useful information to their audiences to assist in the evaluation and purchase of desktop and mobile computers.
- Evaluate desktop and mobile computers to better optimize the performance of the system.

Unlike synthetic benchmarks, which artificially drive components to peak capacity or attempt to deduce performance using a static simulation of application behavior, SYSmark 2014 uses real applications, real user workloads, and real data sets to accurately measure how overall system performance impacts user experience.

SYSmark 2014 builds upon BAPCo's 23-year history of building benchmarks to evaluate platform technologies. Benchmarks designed by BAPCo are the result of cooperative development between companies representing the breadth of the computing industry. They harness a consortium of knowledge to better reflect the business trends of today and tomorrow.

This document describes the methodologies employed in the development of SYSmark 2014. For detailed instructions on how to install and run SYSmark 2014 products, please refer to the documentation provided on the installation media and/or the BAPCo web site (www.bapco.com).

Refer to the BAPCo product versions FAQ located in the SYSmark 2014 support section at www.bapco.com for more information.

2 BAPCo Development Process

BAPCo creates benchmarks in accordance with the BAPCo Development Process, a set of milestones and checkpoints collaboratively developed and agreed upon by the BAPCo membership.

Early in the process, prevailing business personal computer usage models are identified and grouped into scenarios according to their fit within a workflow. Applications are selected for each usage model on the basis of market research and technical feasibility.

BAPCo members then join together with expert application users in development sessions to collaboratively develop a workload specification for each scenario, defining each user/PC interaction which is to be simulated by the benchmark.

The goal of the development sessions is to produce representative business application workloads for the benchmark. Each application workload consists of three elements: the input data set, the tasks performed on the input data set, and the generated output. An example of generated output would be an image generated through an iterative process of steps to create a desired appearance. These three elements of the workload are chosen to represent the workflow of a user skilled in each given application.

After the workload specifications are created at the development sessions, BAPCo developers implement the workloads according to those specifications while satisfying benchmarking constraints to ensure the stability of the benchmark, the consistency of results, and the feasibility of implementation and distribution of the benchmark.

2.1 Milestone Overview

The BAPCo development process is divided into six major phases (Initialization, Design and Planning, Implementation, Validation, Characterization and Launch). Each phase consists of a series of milestones, some of which may be worked on concurrently.

The membership must vote to close each milestone. Once all the milestones within a phase are complete, the membership must vote to exit the phase and enter the next phase. BAPCo members work in a collaborative process where decisions regarding products are sometimes made by majority vote rather than unanimously.

The following is the list of the development phases and the corresponding milestones. Some of these milestones are explained in greater detail in the following sections, as noted in this list.

1. **Initialization Phase**
    a. Milestone 0 – Committee kickoff
    b. Milestone 1 – Benchmark market and customer analysis
    c. Milestone 2 – Product positioning and customer value proposition
    d. Milestone 3 – Preliminary marketing requirements document
    e. Milestone 4 – Final marketing requirements document
2. **Design and Planning Phase**
    a. Milestone 5 – Preliminary engineering requirements document
    b. Milestone 6 – Usage model selection *(see section 2.2)*
    c. Milestone 7 – Application selection *(see section 2.3)*
    d. Milestone 8 – Define member resource commitments
    e. Milestone 9 – Define development infrastructure
    f. Milestone 10 – Define scoring methodology *(see section 2.4)*
    g. Milestone 11 – Define application licensing requirements
    h. Milestone 12 – Plan and execute workload development sessions *(see section 2.5, 2.6)*
    i. Milestone 13 – Define product release criteria
    j. Milestone 14 – Select product name
3. **Implementation Phase**
    a. Milestone 15 – Create implementation schedule
    b. Milestone 16 – Determine calibration system *(see section 2.7)*
    c. Milestone 17 – Software development *(see section 2.8)*
4. **Validation Phase**
    a. Milestone 18 – Validation testing
    b. Milestone 19 – Define risk management plan
5. **Characterization Phase**
    a. Milestone 20 – Characterization testing
    b. Milestone 21 – Beta testing
6. **Launch Phase**
    a. Milestone 22 – Product pricing
    b. Milestone 23 – Pre-launch materials
    c. Milestone 24 – Release to manufacture vote and sign-off
    d. Milestone 25 – Duplicate and distribute media
    e. Milestone 26 – Post-launch materials

2.2 Usage Model/Scenario Selection

In milestone 6 of the BAPCo Development Process, PC usage models are chosen for inclusion in a benchmark. For SYSmark 2014, BAPCo chose a wide variety of usage models in which the user experience is influenced by system performance.

BAPCo then grouped related usage models into 3 scenarios – Office Productivity, Media Creation, and Data/Financial Analysis. Each of these scenarios is described as follows:

Office Productivity

The Office Productivity scenario models productivity usage including word processing, spreadsheet data manipulation, email creation/management and web browsing.

Media Creation

The Media Creation scenario models using digital photos and digital video to create, preview, and render advertisements for a fictional businesses.

Data/Financial Analysis

The Data/Financial Analysis scenario creates, compresses, and decompresses data to review, evaluate and forecast business expenses. Also, the performance and viability of financial investments is analyzed using past and projected performance data.

2.3 Application Selection

In milestone 7, after the usage models have been collected into scenarios, applications are chosen for the scenarios on the basis of market research and technical feasibility.

Sufficient lead time is needed after the applications are selected for BAPCo to develop workloads, integrate the applications into the benchmark, and perform validation of the benchmark. Therefore, some of the application versions are not the newest available at the time of the launch of SYSmark 2014.

For SYSmark 2014, BAPCo has identified the following representative applications for the three usage scenarios.

A summary of the application versions installed and used by SYSmark 2014 version 1.0.0.15 is included in Appendix A.

Application	Version	Document Type
Adobe® Acrobat®	Pro XI	Portable document files, image files
Google® Chrome®	32.0	Web pages
Microsoft® Excel®	2013	Spreadsheets
Microsoft® OneNote®	2013	Free-form information gathering and multi-user collaboration
Microsoft® Outlook®	2013	E-mails
Microsoft® PowerPoint®	2013	Presentation files, image files, video files
Microsoft® Word®	2013	Word processing documents
WinZip®	Pro 17.5	Zip files, assorted document files

Table 1: Office Productivity Applications

Application	Version	Document Type
Adobe® Photoshop®	CS6 Extended	Image files
Adobe® Premiere®	Pro CS6 (On 64-bit Operating Systems)	Video files
Adobe® Premiere®	Pro CS4 (On 32-bit Operating Systems)	Video files
Trimble® SketchUp™	Pro 2013	CAD files, image files

Table 2: Media Creation Applications

Application	Version	Document Type
Microsoft® Excel®	2013	Spreadsheets
WinZip®	Pro 17.5	Zip files, assorted document files

Table 3: Data/Financial Analysis Applications

2.4 Scoring Methodology

In milestone 10, BAPCo decides the types of results that will be produced by a benchmark and the scoring methodology that determines how those results are calculated.

Importantly, BAPCo determines the scoring methodology before determining the content of the workloads, which helps ensure that a methodology is chosen for its ability to generate results that correspond to user experience, not for the results it produces on a pre-determined set of workloads.

For SYSmark 2014, BAPCo evaluated the merits of a variety of scoring methodologies and chose a methodology on the basis of how it met the following criteria:

- The scoring methodology should give expected results:
  - The resulting score should differentiate between systems with different performance.
  - The resulting score should be repeatable and not have high variation.
  - The resulting score should not be affected by benchmark artifacts, such as the number of tasks within a scenario.
- The relative performance between any two systems should not be affected by the selection of the calibration system.
- The resulting score should reflect the performance of user initiated multitasking operations.
- The scoring methodology should be easy to understand.

SYSmark 2014 measures system performance by measuring the response time of tasks on a PC using real applications and simulated user input. In the SYSmark 2014 scoring methodology, task response times are used to generate a performance rating that reflects the user experience. The faster a PC responds to the application workloads in SYSmark 2014, the higher its SYSmark 2014 performance ratings will be.

For more information on how task response times are measured, see section 2.8.

A complete SYSmark 2014 run will output three scenario performance ratings (one for each scenario) and an overall performance rating.

Scenario Rating

Each scenario has a rating calculated by taking the sum of the response times of tasks in that scenario as performed on the test system and then comparing it with the sum of those same task response times as performed on the calibration system (see section 2.7). The calibration sum is divided by the measured sum on the test system and multiplied by 1000. The result is then rounded to the nearest integer.

Overall Rating

The SYSmark Overall Rating is calculated by taking the geometric mean of all the scenario ratings (prior to rounding). The result is then rounded to the nearest integer. To obtain an overall rating, you must run all scenarios.

2.5 Workload Development Sessions

Once the usage models, scenarios, applications, and scoring methodology for the benchmark are decided, BAPCo members and application experts meet to create the application workloads that will be used in the benchmark.

For SYSmark 2014, the workload development sessions consisted of one week of face-to-face meetings that included representatives from BAPCo member companies and expert application users who had professional experience with the applications chosen for the benchmark. The application experts included professionals in the fields of small business marketing, financial forecasting, graphic design, video editing, web development, and enterprise IT deployment.

In the workload development sessions, the experts take the lead, weaving the usage models supplied by BAPCo into a storyboard of user interactions with a series of applications. Each user/PC interaction is written down in a workload specification, the specification used to automate the workloads later.

At the end of the workload development sessions, BAPCo comes away with a detailed workload specification for each of the benchmark scenarios and all of the input data sets needed to reproduce the workloads created at the sessions.

Additional Workload Considerations

The following additional factors come into consideration at the workload development sessions:

Input Data Set

Frequently in the sessions, the experts need raw digital content to serve as a input data set for a workload. Examples of such content might include a video to transcode, a presentation to modify, or documents to compress. When experts need such content, care is taken to ensure that they use something that is functionally representative of content they might use or encounter professionally.

For instance, if pictures are needed in order to create a web photo gallery, an expert might walk outside and take pictures using the same equipment he/she uses professionally. If a 3D model of a building is needed for a landscape workload, an expert might purchase a stock model from his/her usual online resource. Like the user interactions, all of these source materials are captured at the development session and used later in the development of automated workloads.

Task Switching and Concurrent Execution

In some cases, experts are encouraged to switch between open applications (e.g., as a user might between an e-mail program, word processor, and spreadsheet) or to leave activities running in the background as they perform work in another application (e.g., as a user might leave a compression task to run in the background while browsing the web).

In SYSmark 2014, the Office Productivity scenario makes extensive use of task switching and concurrent execution.

2.6 Scenario Workload Descriptions

The scenario workloads created at the workload development sessions for SYSmark 2014 are described below:

Office Productivity

Read and manipulate notes from a notebook. Browse multiple web sites which include a blog, online shopping site, wiki site and social networking site. Archive a diverse set of files into a single encrypted file. Convert a PDF document into an editable word processing document. Perform and mail merge. View a complex presentation that include multimedia and export it to PDF. Combine multiple scanned pages from a complex document into an encrypted PDF document using optical character recognition (OCR). Read, create and search for emails. Create and execute a rule on email inbox. Use a spreadsheet program to do data analysis.

Media Creation

Create a panoramic image using an image editing application, combine a set of photos into one high dynamic range (HDR) image, and adjust and prepare both images for print. Transcode the video to a format suitable for web publishing using a video editing application. Add visual features to an existing architectural model, and render "sketch" style views using an architectural modeling application.

Data/Financial Analysis

Generate sales forecasts by region and currency based on historical data, and produce summary graphs and pivot tables using a spreadsheet application. Create an encrypted archive of various sensitive files for transfer across unsecured communications. Decompress the encrypted and unencrypted archive files.

2.7 Calibration System

The calibration system is a system chosen in milestone 16 as a reference point for all other SYSmark 2014 results. BAPCo chose the configuration below for its wide availability and its representation of a typical mainstream PC at the time of release of SYSmark 2014.

SYSmark 2014 has been calibrated in such a way that a PC with performance equivalent to this calibration system for a given workload will have a performance rating of 1000. A system twice as fast as the calibration system on a given workload (or, equivalently, that responds in half the time on average) will have a performance rating of 2000. This is true for both overall ratings and scenario ratings.

The calibration system for all SYSmark 2014 products has the following configuration:

- HP® ProDesk 600 G1
- Intel Core i3-4130 Processor (3.40GHz, 3MB Cache)
- 4GB PC3-12800 (DDR3-1600) SDRAM (1 DIMM)
- Integrated Intel HD 4400 Graphics
- Integrated High Definition Audio
- Toshiba DT01ACA050 500GB Hard Drive (8M Cache, 7200RPM SATA 3Gb/s)
- Integrated Gigabit Ethernet
- Windows 8.1 Professional 64-bit
- 1920x1080 Display Resolution

A fresh operating system installation is performed on the system.

The calibration sum for each scenario is obtained according to the following process:

- Run SYSmark 2014 on the calibration system (process idle tasks enabled, conditioning run enabled, 9 iterations)
- Calculate an overall score for each of the 9 iterations by taking geometric mean of all scenario scores for that iteration
- Identify the median iteration by finding the iteration with the median overall score
- The calibration sum for each scenario is the response time total from that scenario in the median iteration

For more details about the configuration of the calibration system, please contact support@bapco.com.

Please note that the minimum requirements to run SYSmark 2014 products are listed in Appendix B and are not equivalent to the calibration system.

2.8 Benchmark Implementation

Once the workload specifications have been created, BAPCo begins the important work of translating the workload specifications into an automated benchmark in milestone 17.

SYSmark 2014 is built upon scripts that do things much the way a user would, using controls like buttons, text input boxes, and menus to navigate applications. See Appendix C for screenshots of the benchmark in action.

To ensure that SYSmark 2014 has deterministic behavior, BAPCo uses a framework to install applications, collect system information, run the scenario scripts, record performance measurements, calculate performance ratings, and display test results. The framework is kept lightweight, consuming a minimal amount of memory and compute resources, in order to ensure that performance measurements reflect the workload performance and do not include overhead from the framework.

The fundamental performance unit in SYSmark 2014 is *response time*. Response time is defined as the time it takes the computer to complete a task that has been initiated by the automated script. A task can be initiated by a mouse click or a keystroke. The duration of each task is measured by the framework. Examples of tasks include launching an application, finding text in a document, copying a file, encoding a video, and performing an image manipulation.

The framework has several methods of detecting task completion, depending upon the method the application uses to signal task completion to the user. For example, the framework may wait for the application to show a completion message in the form of a pop-up window, or may wait for a progress dialog to disappear and for control of the application to be returned to the user.

3 Workload Characteristics

This section provides data illustrating the performance characteristics of SYSmark 2014 version 1.0.0.15.

3.1 Sensitivity Analysis

The series of tables below shows the sensitivity of SYSmark 2014 to different system characteristics, including the amount of system RAM, CPU frequency, number of CPU cores, graphics adapter, I/O technology, operating system and display resolution.

Within each study only one system component (e.g. memory) is varied. All the other system components are held constant. To best illustrate the sensitivity, one configuration is chosen as a baseline and the ratings for the other configurations are shown as the percentage difference relative to the baseline.

In order to give better control over system configuration, not all sensitivity charts use the same baseline configuration. Note the configuration details below each table and be aware that component sensitivities will vary from one configuration to the next.

Due to system implementation differences, these figures are only accurate for the configuration description listed below in each sub-section. These sensitivities will vary from one configuration to the next.

3.1.1 Sensitivity to System Memory Capacity

The total system memory is changed from 2 GB to 4 GB to 8 GB to 16 GB. In all configurations, two sticks of memory were used in dual-channel mode.

System Memory Capacity Sensitivity	2 GB (2x1 GB)	4 GB (2x2 GB)	8 GB (2x4 GB)	16 GB (2x8 GB)
Office Productivity	0%	+5.1%	+4.3%	+5.3%
Media Creation	0%	+2.9%	+6.1%	+7.0%
Data/Financial Analysis	0%	+0.9%	+2.2%	+1.2%
SYSmark® 2014 Overall Rating	**0%**	**+3.0%**	**+4.2%**	**+4.5%**

Table 4: System Memory Sensitivity
Intel Core i7-4960X processor @ 3.6 GHz, Asus X79-Deluxe motherboard, Intel 530 240GB Solid State Drive, DDR3-1333 dual channel SDRAM, AMD Radeon R9 290X Graphics Card, 1920x1080 video resolution, Microsoft Windows 8.1 64-bit

3.1.2 Sensitivity to CPU Frequency

The CPU frequency of a system is changed from 1.8 GHz to 3.6 GHz in steps of 600 MHz. For these tests, Intel Turbo Boost Technology and Intel Hyper-Threading Technology have been disabled to ensure the CPU frequency and core count are held to a specified value.

CPU Frequency Sensitivity	1.8 GHz	2.4 GHz	3.0 GHz	3.6 GHz
Office Productivity	0%	+29.7%	+57.4%	+85.7%
Media Creation	0%	+31.5%	+62.5%	+92.6%
Data/Financial Analysis	0%	+26.2%	+47.4%	+67.7%
SYSmark® 2014 Overall Rating	**0%**	**+29.1%**	**+55.6%**	**+81.6%**

Table 5: CPU Frequency Sensitivity
Intel Core i7-4960X processor with Turbo Boost Technology disabled, Asus X79-Deluxe motherboard, Intel 530 240GB Solid State Drive, 8GB DDR3-1333 dual channel SDRAM, AMD Radeon R9 290X Graphics Card, 1920x1080 video resolution, Microsoft Windows 8.1 64-bit

3.1.3 Sensitivity to CPU Core Count

The number of CPU cores is controlled by changing system BIOS settings to enable 2 cores, then 4 cores, and finally all 6 cores of a 6-core processor. For these tests, Intel Turbo Boost Technology and Intel Hyper-Threading Technology have been disabled to ensure the CPU frequency and core count are held to a specified value.

CPU Core Count Sensitivity	1 Core	2 Cores	4 Cores	6 Cores
Office Productivity	0%	+34.2%	+52.3%	+62.2%
Media Creation	0%	+68.8%	+149.6%	+200.5%
Data/Financial Analysis	0%	+82.3%	+204.6%	+288.5%
SYSmark® 2014 Overall Rating	**0%**	**+60.4%**	**+126.3%**	**+166.5%**

Table 6: CPU Core/Thread Sensitivity
Intel Core i7-4960X processor @ 3.6GHz with Turbo Boost Technology disabled, Asus X79-Deluxe motherboard, Intel 530 240GB Solid State Drive, 8GB DDR3-1333 dual channel SDRAM, AMD Radeon R9 290X Graphics Card, 1920x1080 video resolution, Microsoft Windows 8.1 64-bit

3.1.4 Sensitivity to Graphics Subsystem

The video card is changed according to the table below. For these tests, we used discrete video cards all from the same manufacturer to ensure the graphics driver family and available physical system memory from each configuration was constant.

Graphics Subsystem Sensitivity	AMD 4350	AMD R7 240	AMD R9 290X
Office Productivity	0%	+3.7%	+2.0%
Media Creation	0%	+4.3%	+4.8%
Data/Financial Analysis	0%	+0.9%	+1.3%
SYSmark® 2014 Overall Rating	**0%**	**+3.0%**	**+2.7%**

Table 7: Graphics Subsystem Sensitivity
Intel Core i5-4670K processor @ 3.4 GHz, Asus Maximus VI Hero Z87 motherboard, Intel 530 240GB Solid State Drive, 8GB DDR3-1600 dual channel SDRAM, 1920x1080 video resolution, Microsoft Windows 8.1 64-bit

3.1.5 Sensitivity to I/O Subsystem

The primary storage device is changed according to the table below.

I/O Sensitivity	1 TB 5900 RPM HDD ST1000VM002	240 GB SSD SSDSC2BW240A4
Office Productivity	0%	+11.7%
Media Creation	0%	+20.3%
Data/Financial Analysis	0%	+22.6%
SYSmark® 2014 Overall Rating	**0%**	**+18.1%**

Table 8: I/O Sensitivity
Intel Core i7-4960X processor @ 3.6 GHz, Asus X79-Deluxe motherboard, 8GB DDR3-1333 dual channel SDRAM, AMD Radeon R9 290X Graphics Card, 1920x1080 video resolution, Microsoft Windows 8.1 64-bit

3.1.6 Sensitivity to Operating System

The operating system is changed according to the table below.

Operating System Sensitivity	Windows 7 SP1 64-bit	Windows 8.1 64-bit
Office Productivity	0%	+3.4%
Media Creation	0%	-1.7%
Data/Financial Analysis	0%	+5.1%
SYSmark® 2014 Overall Rating	**0%**	**+2.2%**

Table 9: Operating System Sensitivity
Intel Core i7-4960X processor @ 3.6 GHz, Asus X79-Deluxe motherboard,
Intel 530 240GB Solid State Drive, 8GB DDR3-1333 dual channel SDRAM,
AMD Radeon R9 290X Graphics Card, 1920x1080 video resolution

3.2 Application Contribution Analysis

The following charts shows the approximate contribution of each application to the SYSmark 2014 version 1.0.0.15 scenario ratings on the calibration system.

Due to system implementation differences, this chart is accurate for the calibration system only. These contributions will vary from one system to the next.

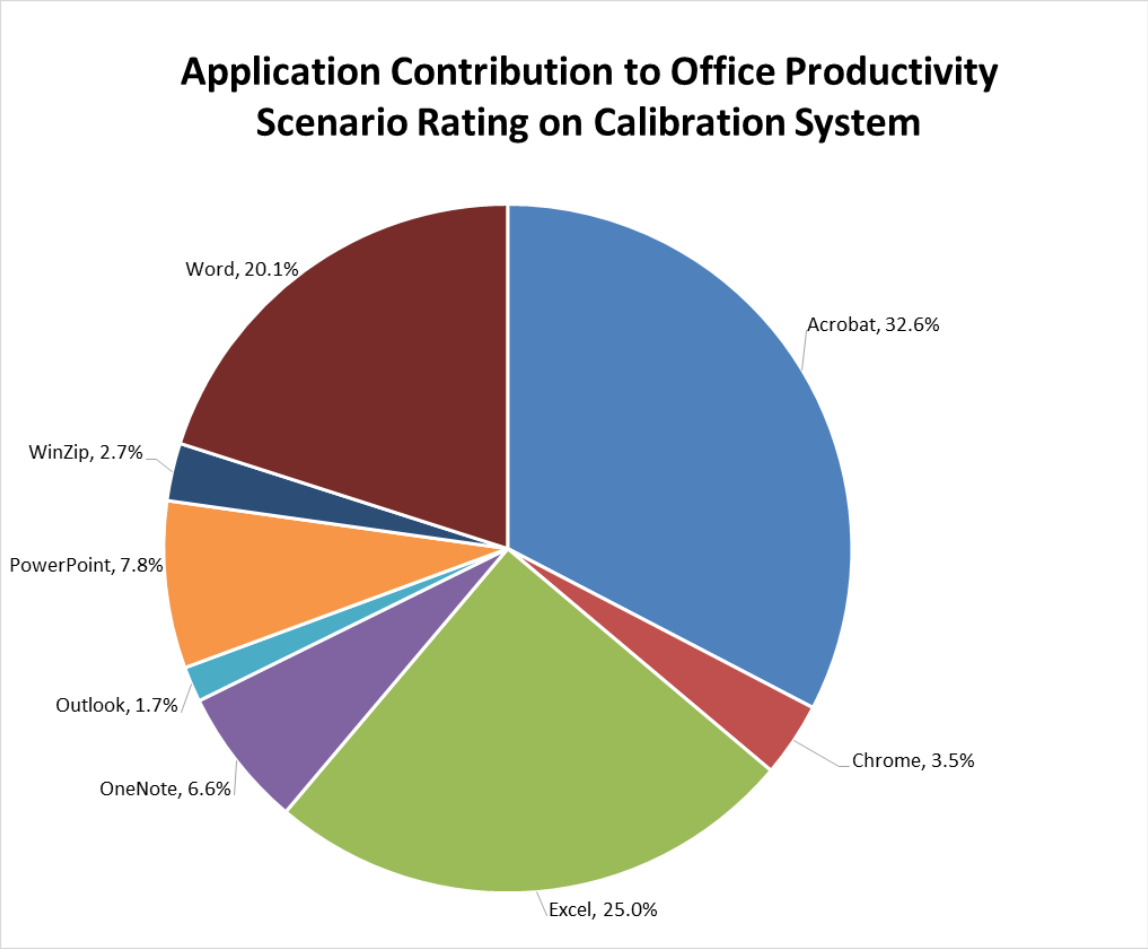

Figure 1: Application Contribution to Office Productivity Scenario Rating
Intel Core i3-4130 processor @ 3.40 GHz, Toshiba DT01ACA050 500 GB 7200 RPM hard disk drive, 4 GB DDR3-1600 SDRAM, Intel HD 4400 Graphics, Microsoft Windows 8.1 64-bit

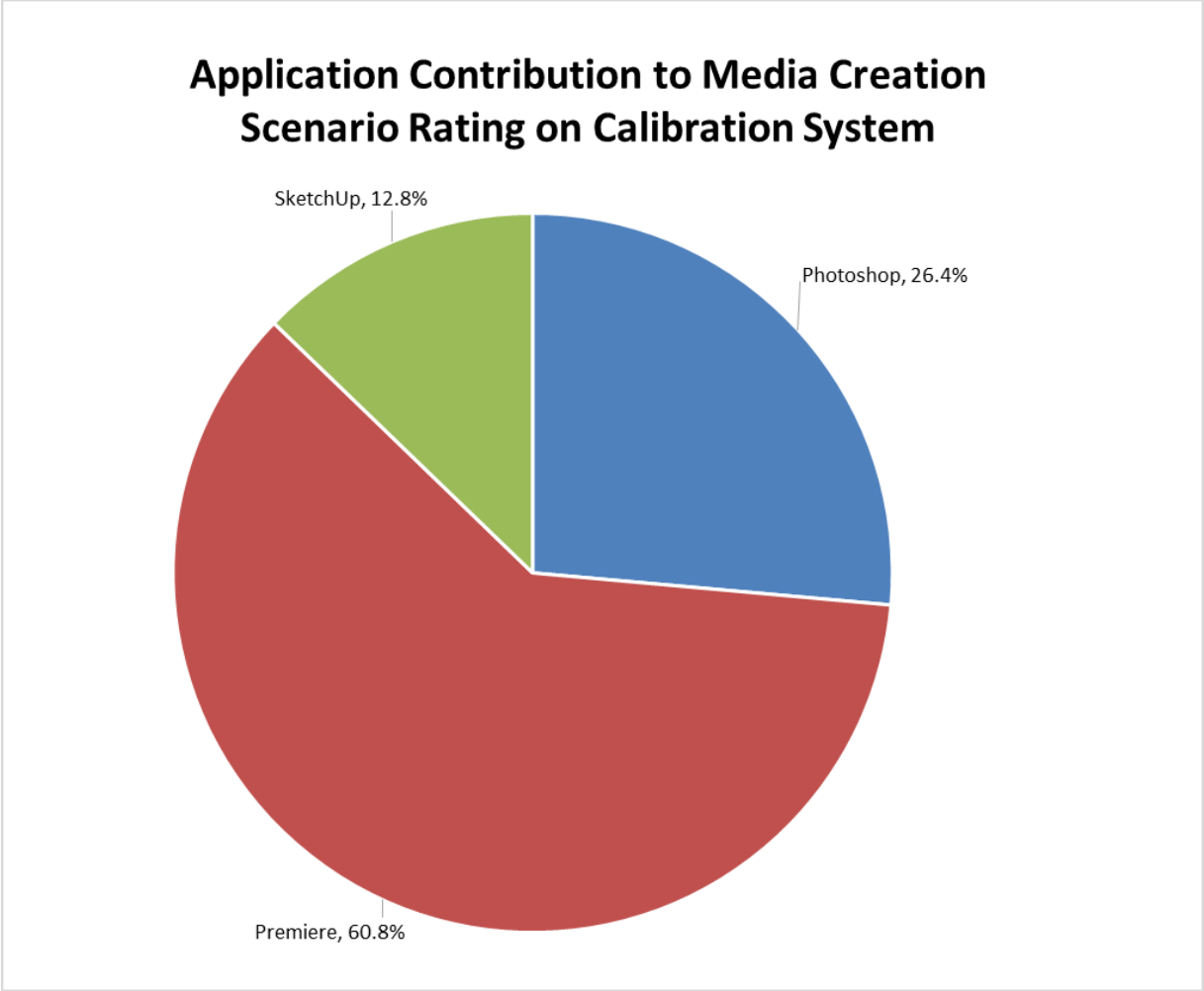

Figure 2: Application Contribution to Media Creation Scenario Rating
Intel Core i3-4130 processor @ 3.40 GHz, Toshiba DT01ACA050 500 GB 7200 RPM hard disk drive, 4 GB DDR3-1600 SDRAM, Intel HD 4400 Graphics, Microsoft Windows 8.1 64-bit

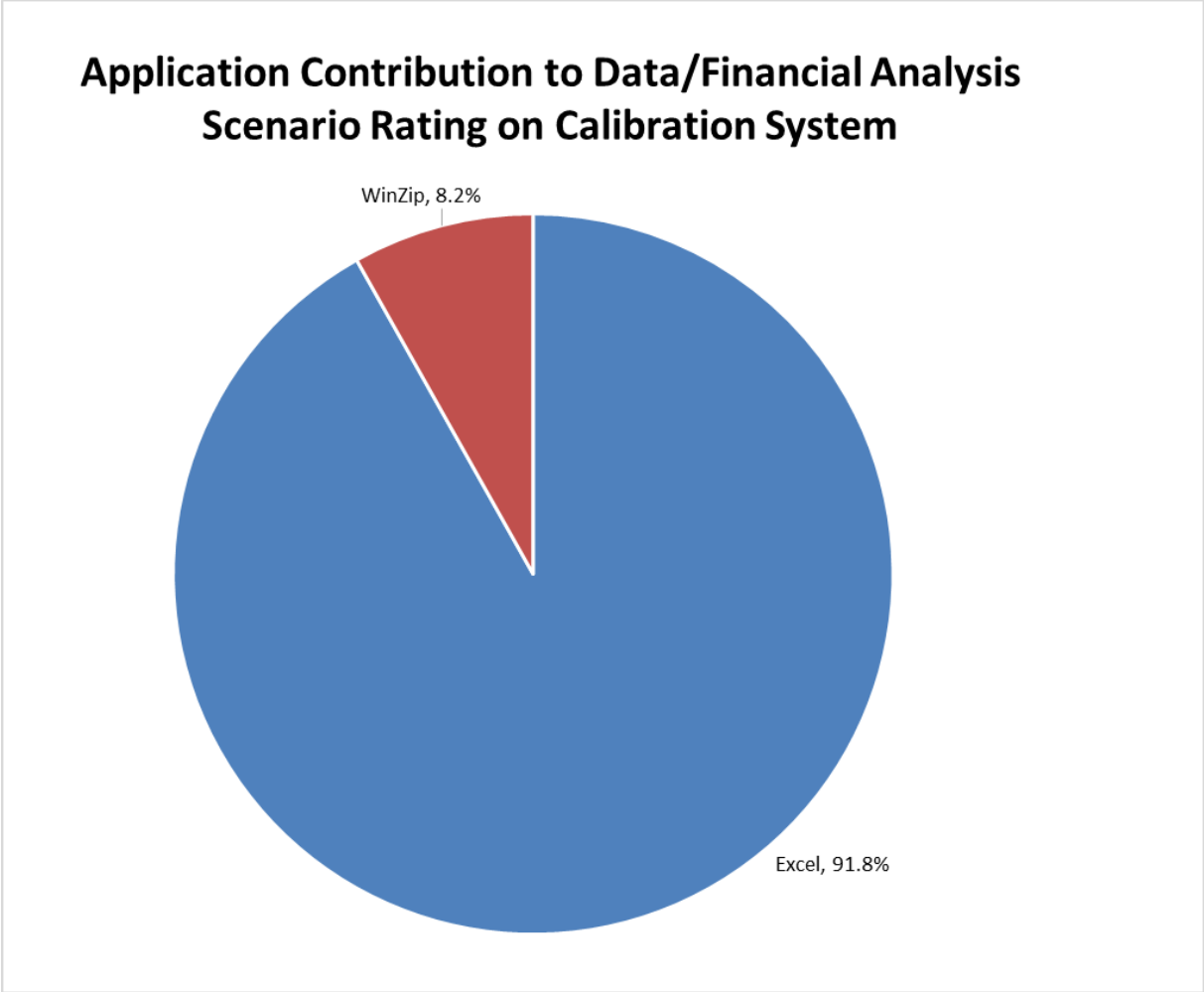

Figure 3: Application Contribution to Data/Financial Analysis Scenario Rating
Intel Core i3-4130 processor @ 3.40 GHz, Toshiba DT01ACA050 500 GB 7200 RPM hard disk drive, 4 GB DDR3-1600 SDRAM, Intel HD 4400 Graphics, Microsoft Windows 8.1 64-bit

APPENDIX A: Application Program Versions

The following applications are installed and used by SYSmark 2014 version 1.0.0.15:

- Adobe® Acrobat® Pro XI
- Adobe® Photoshop® CS6 Extended
- Adobe® Premiere® Pro CS6 (On 64-bit Operating Systems)
- Adobe® Premiere® Pro CS4 (On 32-bit Operating Systems)
- Google® Chrome® 32.0
- Microsoft® Excel® 2013
- Microsoft® OneNote® 2013
- Microsoft® Outlook® 2013
- Microsoft® PowerPoint® 2013
- Microsoft® Word® 2013
- Trimble® SketchUp™ Pro 2013
- WinZip® Pro 17.5
- WinZip® Command Line 3.2

APPENDIX B: Minimum System Requirements

SYSmark 2014 has the following requirements:

- **CPU**: 1.0 GHz AMD® or Intel® dual core processor
- **RAM**: 2 GB
- **Drive Space**: 50 GB of free space on the primary drive
- **Operating System**: Microsoft® Windows® 8.1 32/64-bit, Microsoft® Windows® 8 32/64-bit, or Microsoft® Windows® 7 32/64-bit
- **Video Resolution**: 1024 x 768
- **Graphics**: DirectX 9 compatible

APPENDIX C: Screenshots

The screenshots below are included to illustrate the user interface and workloads included in SYSmark 2014. These screenshots may not accurately depict future releases of SYSmark 2014.

Figure 4: Test Setup

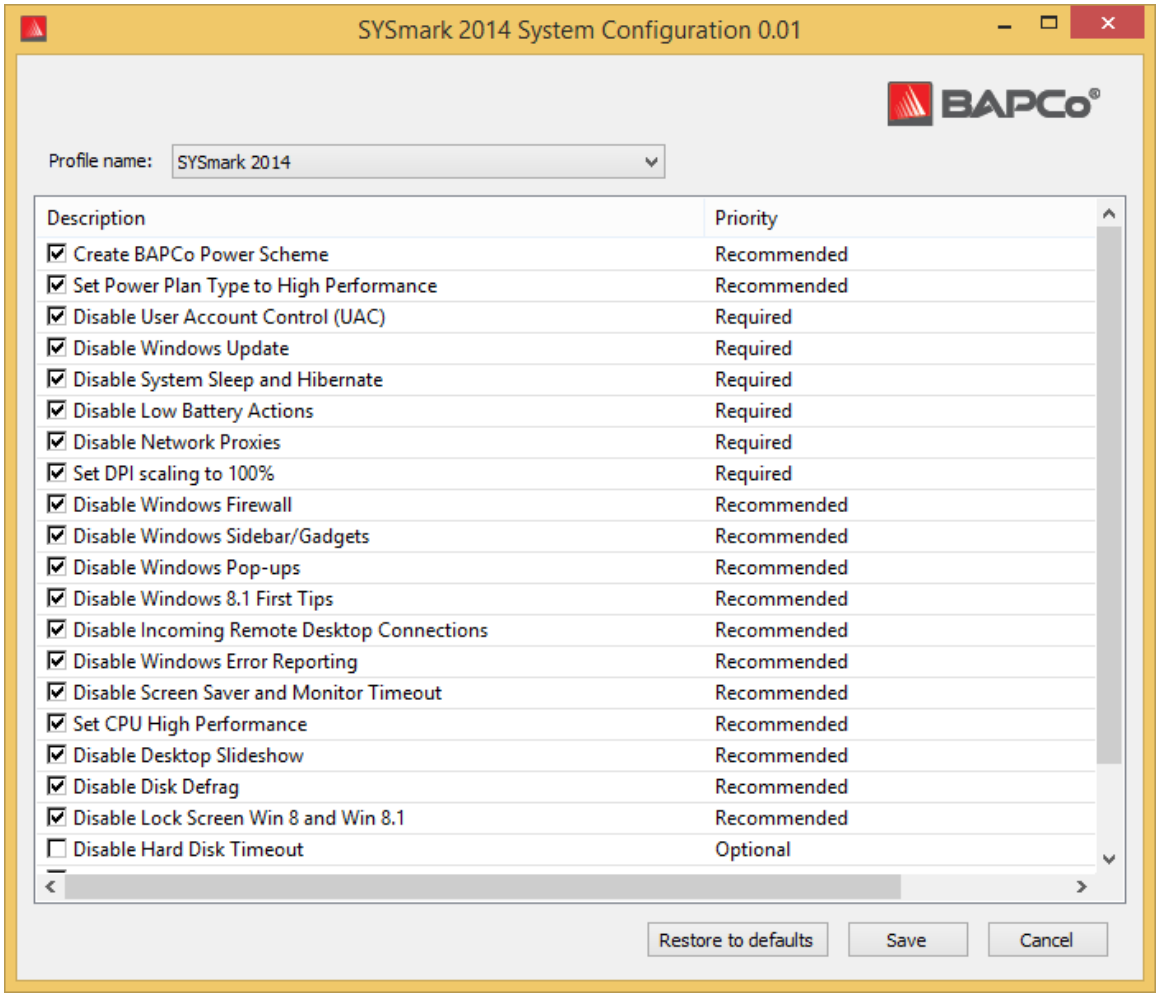

Figure 5: System Configuration
New built-in tool simplifies management of system configuration

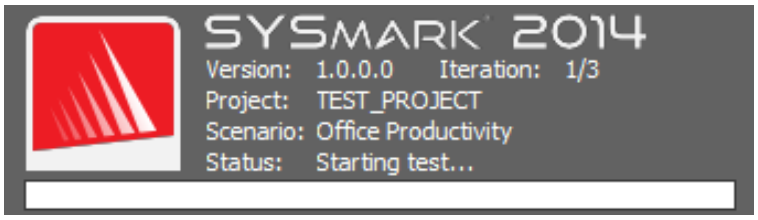

Figure 6: Heads-Up Display
Displayed atop other windows on the top-right of the desktop during testing

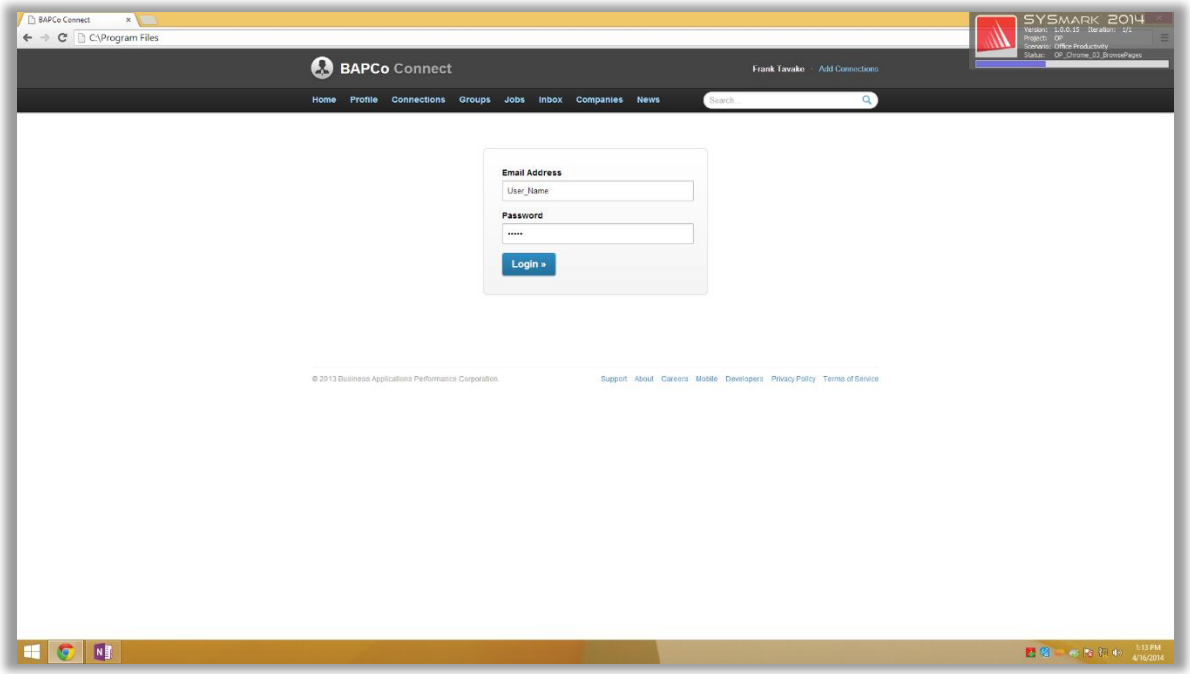

Figure 7: Office Productivity Scenario

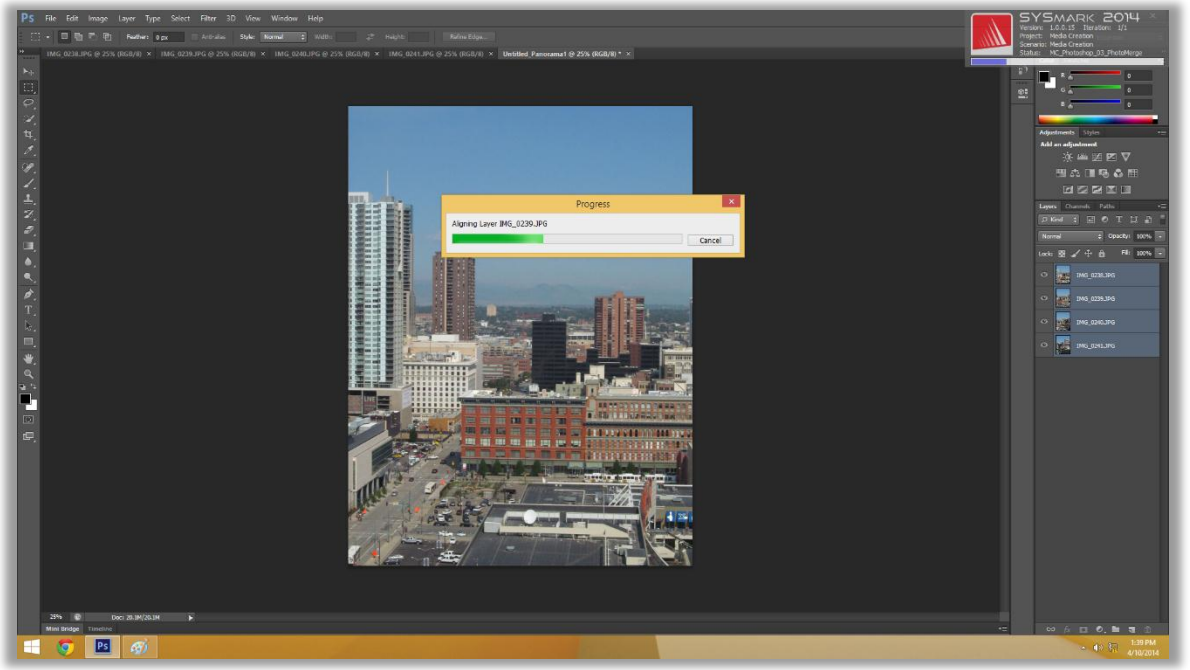

Figure 8: Media Creation Scenario

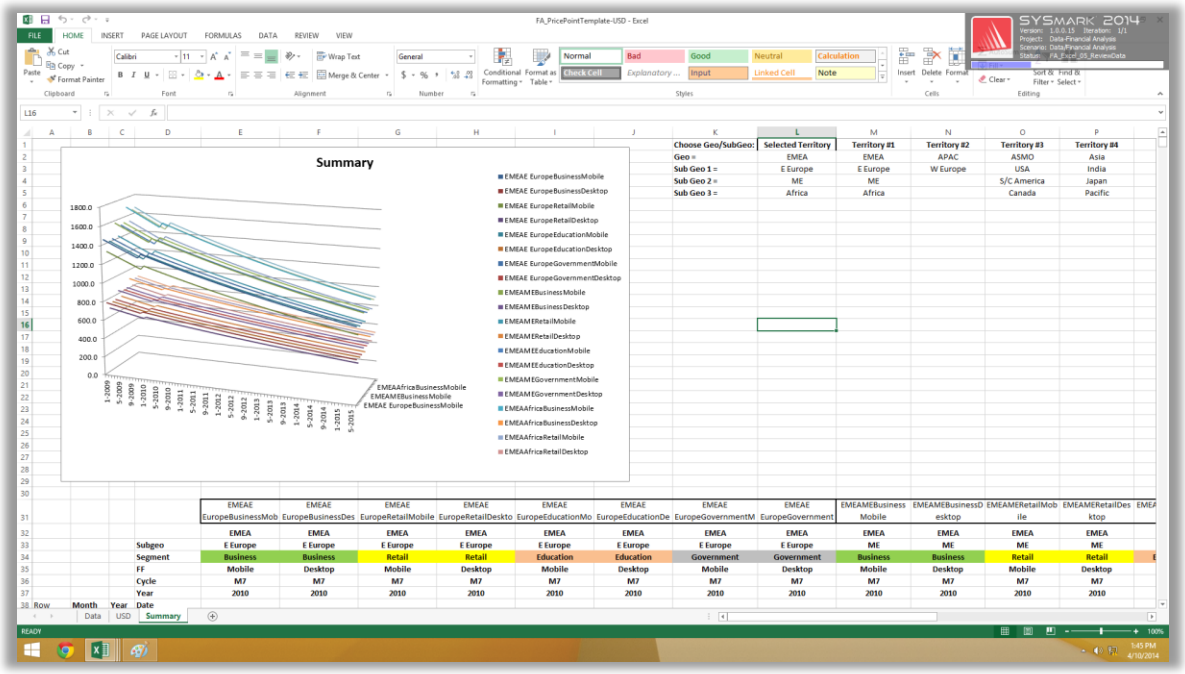

Figure 9: Data/Financial Analysis Scenario

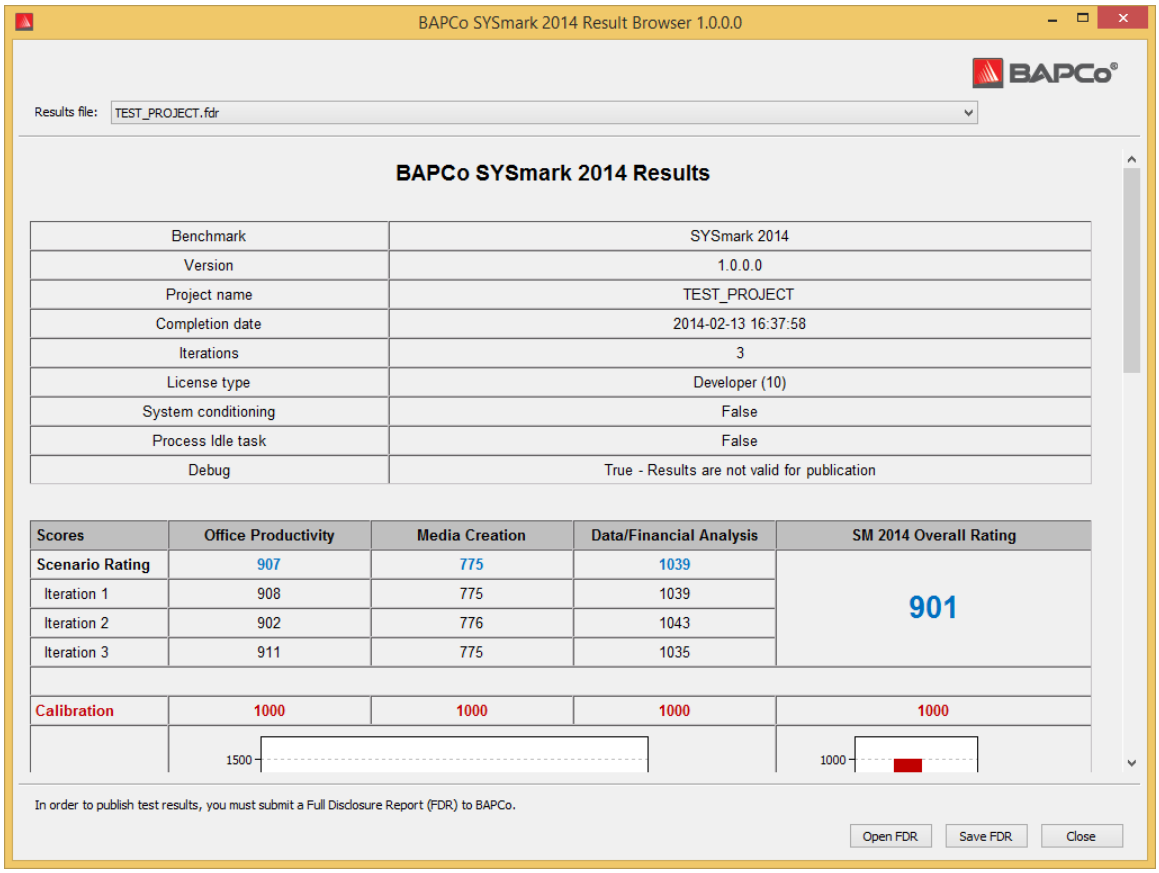

Figure 10: Result Browser