sap and impactECS for manufacturers

cost management and profitability analysis solutions

who wrote this book?

Founded in 1988, 3C Software has become the leading provider of enterprise cost and profitability systems. With over 600 installations in North and South America, Europe, Asia, and Australia, the ImpactECS platform gives business leaders the tools needed to build dynamic models to support the unique and complex analysis required to effectively manage their business.

should i read it?

Short answer... YES! We think everyone should read it. But we think you'll find it especially interesting if you are responsible for cost management and profitability analysis within your company.

are you an sap partner?

Yes, again! 3C Software is a member of the SAP PartnerEdge Program. We are committed to providing our customers with the most technologically sound solutions available. Our certified cost and profitability solution provides an end-to-end, fully-integrated environment for your most important analysis needs.

what's inside?
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chapter one

it starts with costs

For manufacturing companies like yours, the ability to calculate and analyze the cost of the products you build and sell is the key to understanding your company's profitability. If your company has complicated manufacturing processes, large product catalogs, or multiple production facilities, the ability to calculate costs can be a challenging proposition.

48% of manufacturers identified *"must reduce costs"* as one of their top two business drivers that impact their ERP strategies.

ERP in Manufacturing 2012
Aberdeen Group

What we've discovered is that finance and operational leaders in companies like yours are typically working to improve one or more of these three areas:

1   Ability to build budgets and set standard costs

**2**   Visibility into variances and their drivers

3   Ability to predict and analyze how changing conditions - both internal and external – will affect the company's profitability

achieving these objectives are a challenge for **2** reasons

systems

If a company had only one system that housed every piece of data required to run the business, accomplishing these objects would be much simpler. But that's not reality. Most companies have ERP systems, manufacturing execution systems, shop floor data collection and process control systems, data warehouses, business intelligence systems, legacy and mainframe systems and spreadsheets that all contain relevant business data. And often times, multiple instances of these systems exist across the company.
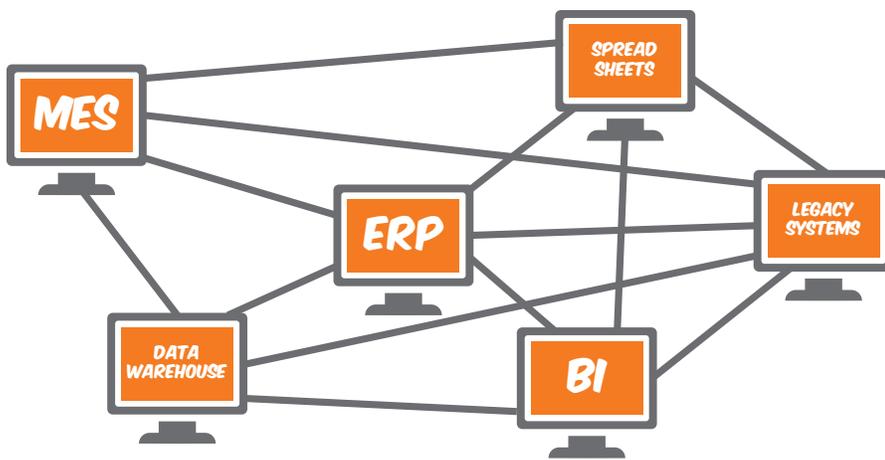
Pulling together data from these disparate systems and harmonizing it is a tough challenge. The goal of identifying tools that help bring this disparate information together is on the short list of every finance executive we've met.

people

Even when the system and data challenges aren't the problem, many organizations lack the vision required to build an end-to-end cost and profitability process. Why? Well first, it's hard. But more than that, it's because we tend to think of information in silos. Creating a fully-integrated cost and profitability system means that you have to take a step back and focus on the flow of data throughout the organization and understand how to leverage technology to facilitate that flow.

chapter two
impactECS and SAP

So we know that you purchased SAP because you wanted a fully-integrated system. Over time, however, you discovered that while it was great for some things like processing large volumes of transactions and generating financial reports, it wasn't well suited for others.

What we've learned by working with some of the world's leading manufacturing companies is that the detailed analysis, forward-looking planning and scenario analysis capabilities in SAP were limited or non-existent. Over time these companies turned to spreadsheets or other tools to get to the information they needed to run the business.

ImpactECS solves that problem because it's the best of both worlds: a technology platform with all the benefits of an enterprise-level system with the ability to customize the logic and interface in a way that is meaningful to your business.

So, what do SAP customers do with ImpactECS?

We'll tell you on the next page…

top **8** ways ImpactECS works with SAP

Standard Costing

Calculating detailed standard costs provides a roadmap to understand the direct, material and overhead costs associated with manufacturing products. SAP users either build or replicate existing cost models in ImpactECS and connect finance data from general ledgers and production data from shop floor systems or data warehouses to calculate costs for each SKU variation.

Multiple Versions of Cost

Rarely do companies rely on just one set of costs. Often manufacturers set their standard costs at the beginning of the fiscal period, but have the need to update those results as time passes. With ImpactECS, SAP users can maintain multiple versions of cost – i.e. frozen standard, current standard, what-if standard – which are all calculated using the same rules and logic.

Process Costing & Rate Building

In manufacturing, costs are accrued as a product moves through the production process. Most companies collect pools of dollars for each cost center and allocate these costs based on a calculated rate. Traditionally, SAP users have relied on spreadsheets to calculate these rates - but with ImpactECS, the rate building process is fully integrated within the cost system. This approach allows you to build rates dynamically based on the complete set of transactional and operational data. It also gives you the ability to manually adjust rates to analyze different performance scenarios.

Actual Costing

Beyond standard costs, manufacturers have a need to know the actual cost of items they produced. With ImpactECS the logic, assumptions and calculations used in the standard cost models is replicated and actual production, raw material usage, and spend data is uploaded to the model to determine the true cost of each unique product.

Variance Analysis

Once you have a benchmark and an actual cost, variance analysis is the next step. With ImpactECS, SAP users can calculate both volume and dollar variances for a specific product and time period. And since there's no limit to how many versions of cost can exist simultaneously, there's no limit to the number and types of variances that can be calculated.

Profitability

Regardless of the methodology used to calculate profits – allocations, activity-based, or absorption models – the most important aspect is creating a standardized process that can provide visibility from every dimension. With ImpactECS, SAP users can generate product- or customer-level P&Ls that expose important performance trends.

Inventory Valuation

Determining the value of both finished goods and work-in-process at the end of the period is a critical step in the closing process. ImpactECS can calculate near-real-time values for as many categories and subcategories of inventory required for your business with specific cost values of each WIP point. It even offers the ability to account for inventory positioned with subcontractors or on consignment with other vendors.

Budgeting and forecasting

Estimating future costs and determining how the business will perform in future periods are critical tasks for manufacturers. SAP users can roll up the detailed product cost calculated in the ImpactECS models to automatically build budgets and write results to back to the general ledger.

What-if analysis

It's what every business leader wants – the ability to see into the future. The ImpactECS sandbox makes it simple to replicate any model and adjust any input – raw material prices, currencies, machine efficiencies, volume and mix, capital expenditures, etc. – to see the effects on both costs and profits for an individual SKU, product family, business unit customer or the entire enterprise.

our SAP customers

Many SAP customers have found significant value in adding ImpactECS to their portfolio of finance and accounting systems.   Here are a few of the companies where ImpactECS has helped to expand the reach of cost and profitability information to the business leaders who need it.

chapter three
what kinds of manufacturers use impactECS?

Because ImpactECS is a platform, it's capable of delivering value for a wide range of manufacturing companies. A few of the industries that we've had noteworthy success include the following:

Paper

With the ability to understand costs at the most basic level – a specific run of a paper grade – on a specific paper machine - mill managers and machine operators can have a deeper understanding of their performance and how to improve. ImpactECS gives paper companies the platform to create an end-to-end cost and profitability system that can account for pulp costs, paper machine efficiencies, broke costs, energy costs, and conversion costs.

Textile and Apparel

Textile and apparel manufacturers tend to have product lines that include lots of variants, and calculating these costs can quickly balloon into an unwieldy task. ImpactECS lets both woven and non-woven textile companies calculate SKU-based detailed product cost models that can account for every variation.

Semiconductor

From fully-integrated manufacturers to manufacturing-free organizations, these companies need visibility into the detailed product costs for their offerings. Three of the biggest costing and profitability challenges for these companies is calculating costs at each WIP point, handling lot splits and joins and managing vendors or subcontractors. The flexible design of the ImpactECS platform gives semiconductor finance and operations teams the ability to handle all three and more in one system.

Food and Beverage

Unlike most industries, food companies – especially protein processors – deal with the challenging prospect of calculating costs for disassembly processes as well as further processing. Handling both in one system could seem counterintuitive, but ImpactECS' architecture allows companies to define the logic used to perform calculations in a method that matches their unique production profile. In addition, ImpactECS can assist food and beverage companies with interpreting the effects of raw material substitutions, commodity and market price changes, and valuing inventories within the same model.

Chemicals and Plastics

Complex BOM and recipe management, changing batch sizes and input streams, and capital-intensive tool and die investments are all significant challenges for companies in these industries. Moreover, these companies tend to have a large number of SKUs that have a specific cost. With ImpactECS, it's possible to have an integrated model that handles the standard setting process, detailed actual costing, and forward looking analysis simultaneously.

Project-Based Manufacturing (including Aerospace & Defense)

Project-based manufactures are required to report actual costs, statistics and variances in multiple views while maintaining detailed cost element data. Large work breakdown structures (WBS) with integrated BOMs that account for WIP items consumed by other WIP items, as well as by final products across multiple producing plants creates a level of complexity that demands a flexible solution like ImpactECS. Additionally, internal and external audit and compliance requirements starting with the bidding process and continuing through program completion are met with ImpactECS.

chapter four

cost objects

At the heart of every model in ImpactECS is the cost object. Cost objects are items that exist within the model that have a specific cost and are finished goods, WIP items, sub-assemblies, co-products, by-products, or anything that has a unique cost associated with it.

Our first example comes from the paper industry. Figure 1 shows the Total Cost Run for a specific paper grade for a particular customer or manufacturing order. ImpactECS integrates with a wide range of systems including ERPs, manufacturing execution systems, data warehouses and business intelligence tools to automatically load relevant data into the model.
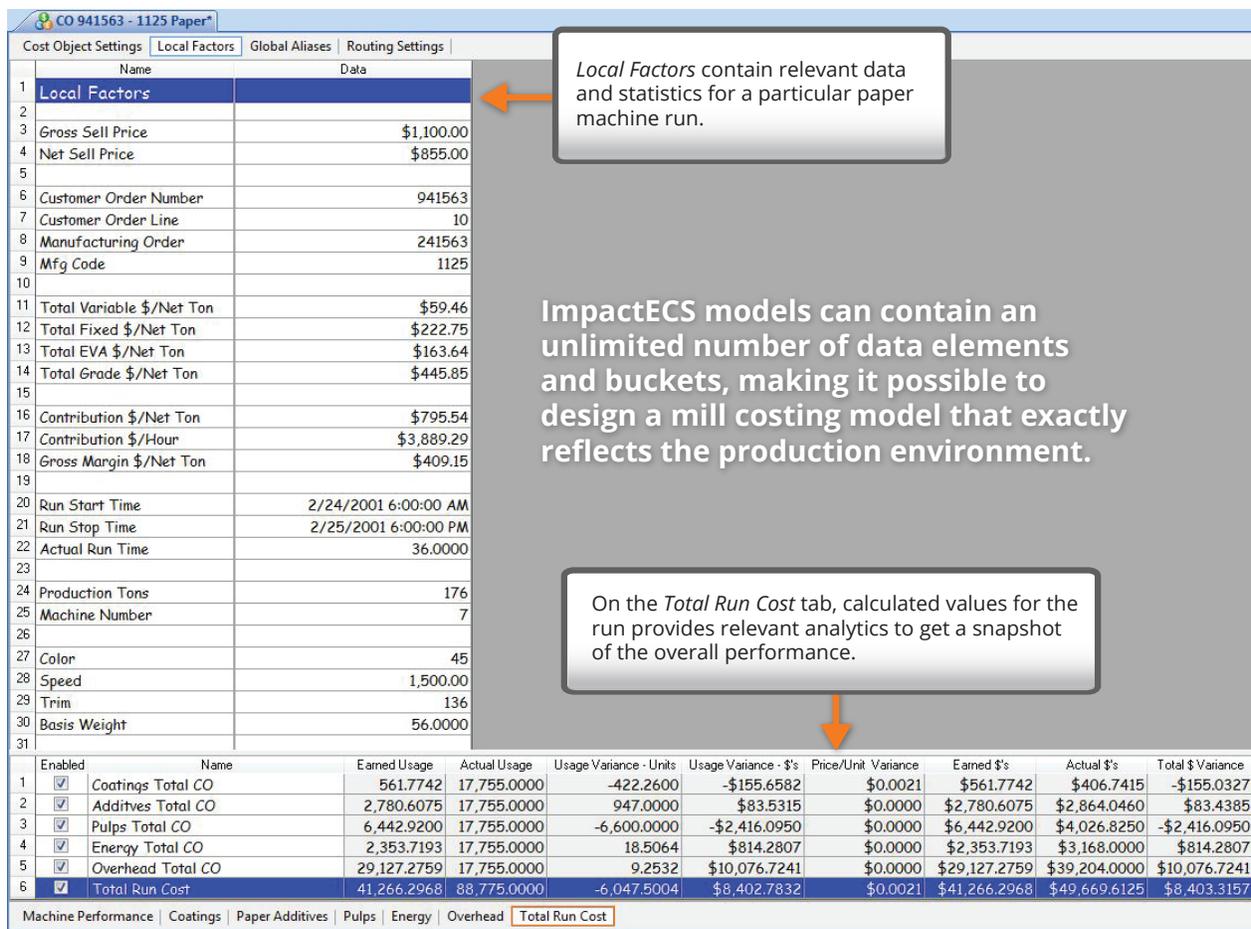
Local Factors contain relevant data and statistics for a particular paper machine run.

ImpactECS models can contain an unlimited number of data elements and buckets, making it possible to design a mill costing model that exactly reflects the production environment.

On the *Total Run Cost* tab, calculated values for the run provides relevant analytics to get a snapshot of the overall performance.

The top portion of the Cost Object view shows the Local Factors – variable data or statistics that are assigned to this product. Local Factor data is dynamically added to the cost object or can be manually inserted. Calculated data is shown in the lower portion of the screen. This example provides the viewer with a quick view of the usage and dollar variances associated with this product.

As you probably noticed, each of the items listed on the summary view has its own tab in the cost object. One of the benefits of ImpactECS is the ability to access detailed cost results with just a few clicks.   In this example, you can review the cost performance of each component of the grade run – machine performance, coatings, paper additives, pulps, energy and overhead – as indicated by the tabs at the bottom of the screen.

	Enabled	Name	Earned Usage	Actual Usage	Usage Variance - Units	Usage Variance - $'s	Price/Unit Variance	Earned $'s	Actual $'s	Total $ Variance
1	✓	Coatings Total CO	561.7742	17,755.0000	-422.2600	-$155.6582	$0.0021	$561.7742	$406.7415	-$155.0327
2	✓	Additves Total CO	2,780.6075	17,755.0000	947.0000	$83.5315	$0.0000	$2,780.6075	$2,864.0460	$83.4385
3	✓	Pulps Total CO	6,442.9200	17,755.0000	-6,600.0000	-$2,416.0950	$0.0000	$6,442.9200	$4,026.8250	-$2,416.0950
4	✓	Energy Total CO	2,353.7193	17,755.0000	18.5064	$814.2807	$0.0000	$2,353.7193	$3,168.0000	$814.2807
5	✓	Overhead Total CO	29,127.2759	17,755.0000	9.2532	$10,076.7241	$0.0000	$29,127.2759	$39,204.0000	$10,076.7241
6	✓	Total Run Cost	41,266.2968	88,775.0000	-6,047.5004	$8,402.7832	$0.0021	$41,266.2968	$49,669.6125	$8,403.3157

Machine Performance | Coatings | Paper Additives | Pulps | Energy | Overhead | Total Run Cost

	Name	Std Lbs/Ton	Earned Usage	Actual Usage	Usage Variance - Units	Usage Variance - $'s	Std Price/Lb	Current Price/Lb	Price/Lb Variance	Earned $'s	Actual $'s	Total $ Variance
1	CTG - 551 - Lustra 7525 - R15	2.1100	371.3600	300.0000	-71.3600	-$5.6742	$0.0795	$0.0816	$0.0021	$29.5287	$24.4800	-$5.0487
2	CTG - 560 - Calcium Carb - R15	1.5600	274.5600	180.0000	-94.5600	-$8.0092	$0.0847	$0.0847	$0.0000	$23.2552	$15.2460	-$8.0092
3	CTG - 676 - TIO2 - R15	1.3600	239.3600	201.0000	-38.3600	-$35.2912	$0.9200	$0.9200	$0.0000	$220.2112	$184.9200	-$35.2912
4	Total Pigments	0.0000	885.2800	681.0000	-204.2800	-$48.9746	$1.0842	$1.0863	$0.0021	$272.9951	$224.6460	-$48.3491
5	CTG - 644 - Latex - R15	2.3000	404.8000	250.0000	-154.8000	-$84.3970	$0.5452	$0.5452	$0.0000	$220.6970	$136.3000	-$84.3970
6	CTG - 591 - Starch Pearl - R15	0.2500	44.0000	20.0000	-24.0000	-$3.6048	$0.1502	$0.1502	$0.0000	$6.6088	$3.0040	-$3.6048
7	CTG - 633 - Sunrez Resin - R15	0.4500	79.2000	58.5000	-20.7000	-$12.5649	$0.6070	$0.6070	$0.0000	$48.0744	$35.5095	-$12.5649
8	CTG - 922 - Cal Sterate - R15	0.2300	40.4800	22.0000	-18.4800	-$6.1169	$0.3310	$0.3310	$0.0000	$13.3989	$7.2820	-$6.1169
9	Total Coatings	0.0000	1,453.7600	1,031.5000	-422.2600	-$155.6582	$0.0000	$0.0000	$0.0021	$561.7742	$406.7415	-$155.0327

Machine Performance | Coatings | Paper Additives | Pulps | Energy | Overhead | Total Run Cost

The Coatings tab shows each of the pigments and coatings used in this grade. The user-defined cost buckets are a mix of standard and actual production values and their accompanying variances for comparison.

	Enabled	Name	Standard	Actual	Variance
1	✓	Tons per Hour	0.0000	0.0000	0.0000
2	✓	Tons per Hour-stan	6.5802	4.8889	-1.6913
3	✓	*Speed	1,500.0000	1,215.8621	-284.1379
4	✓	*Trim	136.0000	132.8276	-3.1724
5	✓	*BasisWeight	56.0000	53.6552	-2.3448
6	✓	*Grade Hours	26.7468	36.0000	-9.2532
7	✓	*Grade Efficiency	80.0000	56.4655	-23.5345

From the Machine Performance tab, mill management and paper machine operators can evaluate the performance of the machine for the specific grade and run.

Machine Performance | Coatings | Paper Additives | Pulps | Energy | Overhead | Total Run Cost

Each tab has a combination of standard and actual cost results and the accompanying variance. So with just a few clicks a complete view of how the run performed is available to easily identify any problem areas.

bill of materials

Bill of material management is another area where ImpactECS can expand SAP's capabilities. ImpactECS models can include detailed views of the BOMs which handle an unlimited number of cost buckets. The model can also account for parent-child relationships while maintaining the cost bucket detail. The indented BOM offers a complete narrative of the costs associated with a particular finished SKU in one view.

An unlimited number of cost buckets gives a comprehensive view of cost associated with every material used.

The expand/collapse functionality of the indented BOM makes it easy to view the cost buckets of the child item from the cost object view.

variance analysis

Variance analysis is where the rubber meets the road when it comes to evaluating performance. One thing is certain, variances aren't meaningful when there's no confidence in the results. With ImpactECS models generating results for both the benchmark and comparative values using the same logic and assumptions, you can be confident that the results describe the true variances.

ImpactECS has lots of options when it comes to analyzing variances. As you saw in the earlier example, a quick variance calculation was incorporated into the cost object. Variances can be calculated on any variable in the model for a given period of time.

A few variance reports are included here to give you an idea of the types of analysis that is possible with ImpactECS. The first screenshot is a report showing labor variances for a specific plan. The other, shown in Microsoft © Excel, calculates the variances between two production runs for the same product.

Summary Labor Report
569 - 3C Software, Inc. - PLANT TOTAL
Reporting Period 7/3/2006 to 8/6/2006

Confidential Information
Date: 03/27/2013

Dept Number	Dept Description	Current Week Earned	Actual	Var	Idx	Month To Date Earned	Actual	Var	Idx	Quarter To Date Earned	Actual	Var	Idx
0302	Preparation					15,392	36,352	(20,960)	2.362	22,203	50,399	(28,195)	2.270
TOTAL PREPARATION						15,392	36,352	(20,960)	2.362	22,203	50,399	(28,195)	2.270
0303	Dyeing					47,624	109,288	(61,663)	2.295	75,218	149,418	(74,200)	1.986
TOTAL DYEING						47,624	109,288	(61,663)	2.295	75,218	149,418	(74,200)	1.986
0305	Finishing					61,345	107,475	(46,130)	1.752	88,127	146,652	(58,525)	1.664
TOTAL FINISHING						61,345	107,475	(46,130)	1.752	88,127	146,652	(58,525)	1.664
0404	Inspection					82,886	128,353	(45,467)	1.549	126,511	171,720	(45,209)	1.357
TOTAL INSPECTION						82,886	128,353	(45,467)	1.549	126,511	171,720	(45,209)	1.357
0301	Miscellaneous						19,466	(19,466)		3,450	26,448	(22,997)	7.665
0491	Warehouse						48,500	(48,500)		9,917	66,859	(56,942)	6.742
0508	Maintenance						109,641						
0534	Division Lab						53,908						
0535	Plant Lab						26,411						
0545	Supply						9,008						
TOTAL SUPPORT							266,934						

569 - 3C Software, Inc. - PLANT TOTAL 207,247 648,401

99-36 Vacation Pay Summary 122,118
99-37 Holiday Pay Summary ..... 59,452 (59,452) 59,452 (59,452)

ImpactECS can produce variance reports using standard reporting tools or Microsoft© Excel.

Run Vs Run Variance Report

Run 1:	20541	Run Start:	1/1/12 12:38 PM	Run 2:	20552	Run Start:	1/4/12 6:07 AM
Object:	0001	Run Stop:	1/2/12 8:47 PM	Object:	0001	Run Stop:	1/4/12 2:56 PM
Grade:	1	Reel Count:	36	Grade:	1	Reel Count:	20
Caliper:	20.00	Moisture:	6.13%	Caliper:	20.00	Moisture:	6.00%
Basis Weight:	250.00			Basis Weight:	250.00		
Run Hours:	29.7			Run Hours:	7.966666667		

PRODUCTION	Tons/Hour Run 1	Run 2	Var	Tons Run 1	Run 2	Var	Tons/MSF Act	Std	Var		Quality Percent of Gross Act	Std	Var
Gross Reel:	33.80	31.77	2.03	1,003.80	943.57	60.23	0.0336	0.1424	(0.1088)				
Good Scaled:	31.11	24.66	6.45	924.04	732.37	191.67	0.0338	0.1395	(0.1057)		92.1%	77.6%	14.4%
Downgrade Scaled	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.0000	0.0000		0.0%	0.0%	0.0%
Offgrade Scaled	1.28	4.33	-3.04	38.15	128.52	-90.37	0.0315	0.1336	(0.1021)		3.8%	13.6%	-9.8%
Total Scaled	66.20	60.76	5.44	1,966	1,804	162	0.0336	0.1406	(0.1070)		195.9%	191.2%	4.6%

	MSF/Hour Run 1	Run 2	Var	MSF Run 1	Run 2	Var	MSF/Ton Act	Std	Var		Quality Percent of Gross Act	Std	Var
Gross Reel:	1,007.24	831.57	175.67	29,915	6,625	23,290	29.80	7.02	22.78				
Good Scaled:	921.26	659.07	262.18	27,361	5,251	22,111	29.61	7.17	22.44		91.5%	79.3%	12.2%
Downgrade Scaled	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00		0.0%	0.0%	0.0%
Offgrade Scaled	40.73	120.71	-79.97	1,210	962	248	31.71	7.48	24.23		4.0%	14.5%	-10.5%
Total Scaled	1,969.23	1,611.35	357.88	58,486	12,837	45,649	29.75	7.11	22.63		195.5%	193.8%	1.7%

reporting

What came first? The need for results to put on the report, or the need to create a report to house all the results. It seems like many finance organizations are driven by the need to deliver reports to a wide variety of audiences. And it's critical that these reports contain accurate and relevant information.

The approach to reporting with ImpactECS has been to offer multiple ways for users to get access to the model data. The platform has a built-in reporting tool based on industry-standard reporting technologies and also connects with any third-party reporting tool, database or data warehouse. In addition, the Excel Add-In allows users to export information directly to Microsoft© Excel.
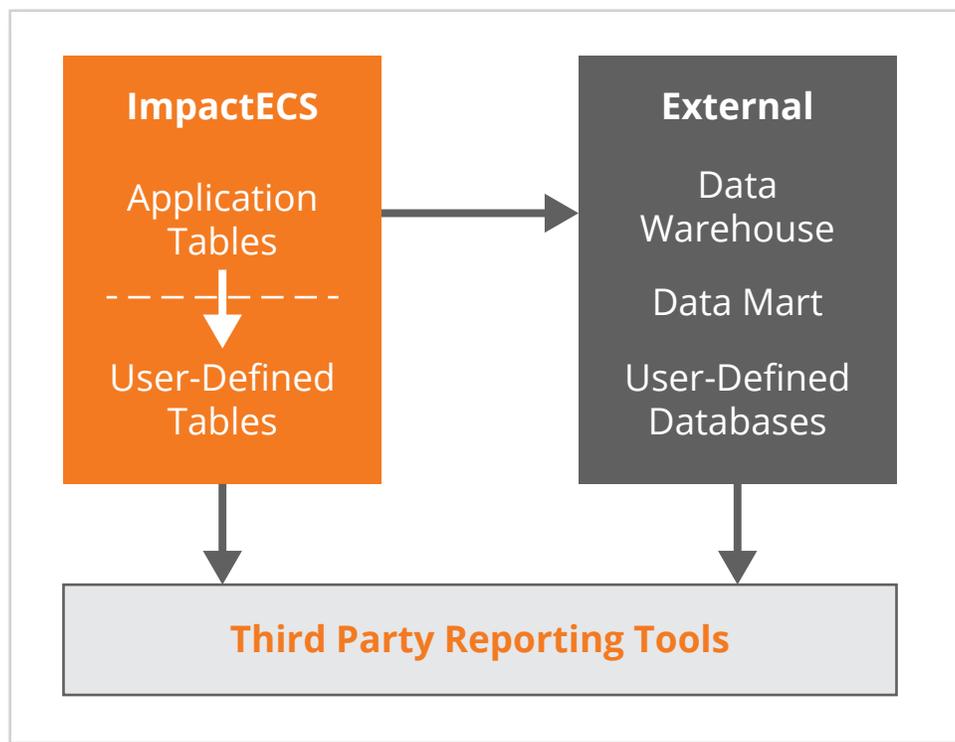
custom user interfaces

Not all ImpactECS users are equal, so the way they use the system shouldn't be either. One of the most utilized configuration features of ImpactECS is the ability to create user-defined interfaces that are tailored to a specific user or task. Here are a few examples of custom user interfaces showing a step-by-step workflow to run the model properly and a report generation screen with access to all the reports available for the model.

scenario and 'what-if' analysis

Now that you've seen a lot of what ImpactECS can do, here's the really amazing part. You can do every single bit of it in a sandbox environment where you can change any input and see the effects of that change throughout the entire model. Imagine the things you could do:

- Calculate costs of new products being developed
- Predict the effects of changing raw material inputs
- See the results of shifting the company's sales plan
- Determine the impact of shifting production of a product to a different location
- Understand the effects of fluctuating currency exchange rates
- We could go on forever, but you get the idea!

Since these predictions are made using the same logic defined in your production system, you can be confident that the results are solely dependent on the changed input and not because of flawed assumptions or miss-keyed spreadsheet formulas.

In this example, a custom form was created so the client could assess the impact of changing commodity prices either as a percent or actual dollar amount. Behind the scenes, ImpactECS identifies every raw material that is impacted by crude market price fluctuations and calculates a new or adjusted price for that raw material. ImpactECS then identifies every product that has any of the affected raw materials listed in the BOM and recalculates the material costs for each affected product.

Commodity Assumption

Enter in the percentage increase for the selected commodity below.
A 0 means no increase. The value entered is an increase over the base price.

○ Dollars   ◉ Percentage   Commodity: Crude ▾

Current	0
Scenario 1	0
Scenario 2	0
Scenario 3	0
Scenario 4	0
Scenario 5	0

[View Adjusted Material Costs]

[Recalculate Model]

contact us

Now that you've finished reading our short review of how we've helped SAP users expand their ability to analyze their company's performance by creating end-to-end cost and profitability models with ImpactECS, we're sure you want to learn more.

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