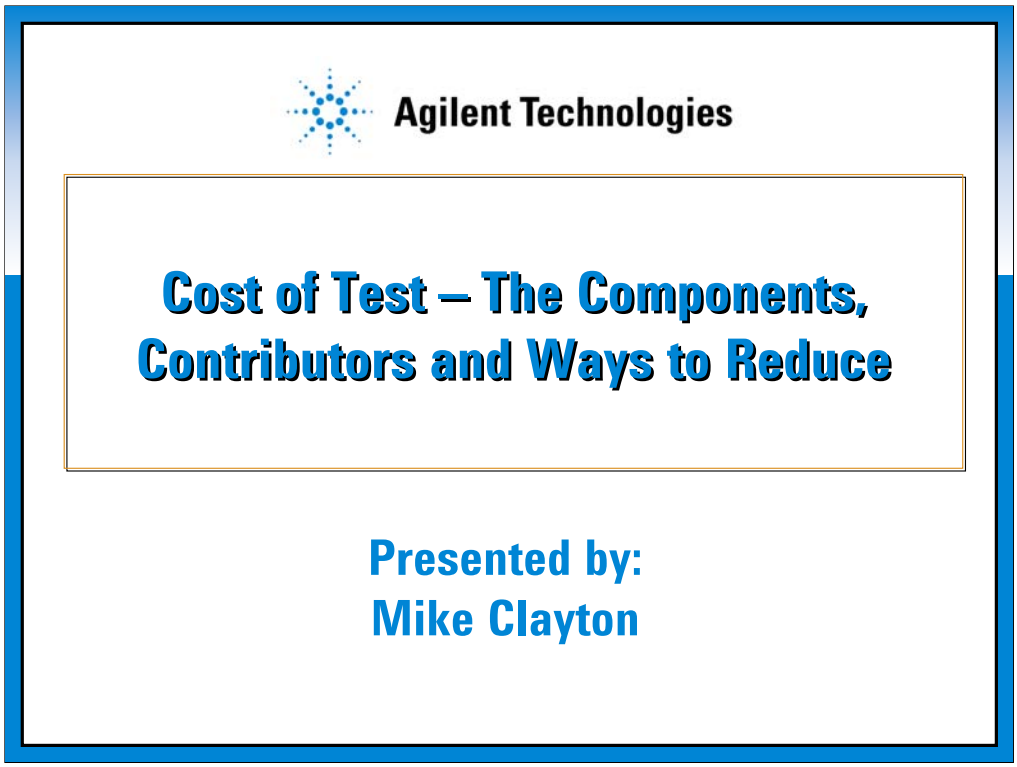
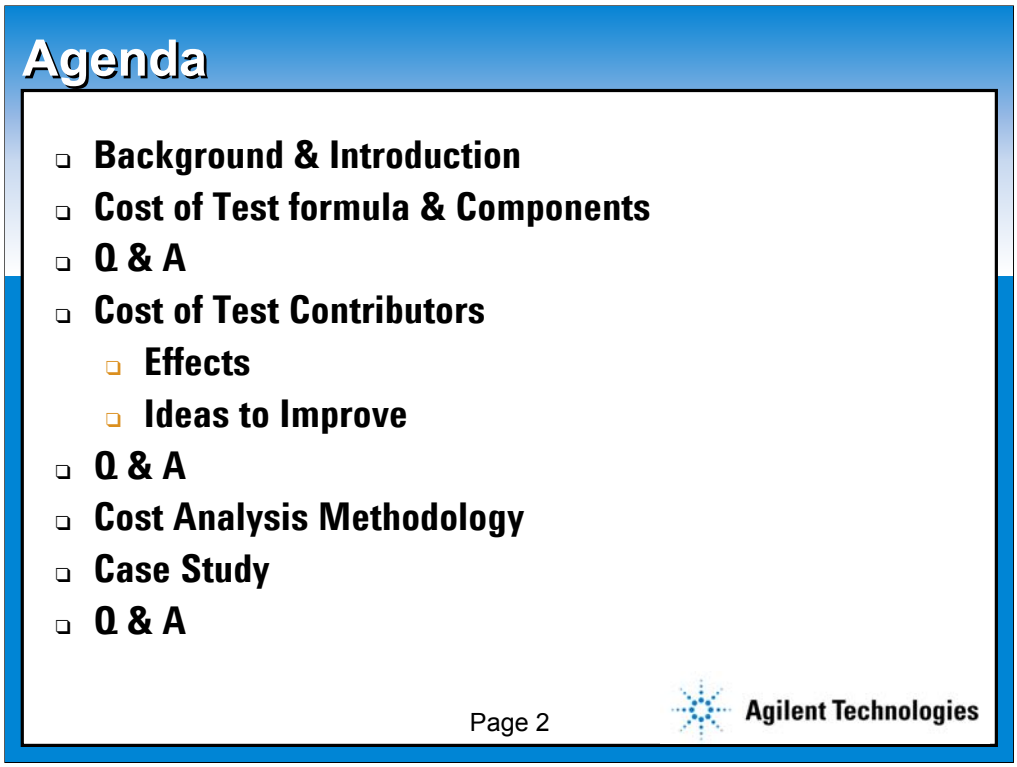


Good morning “Moderator’s name” and good morning to those of you online. As “Moderator’s name” stated my name is Mike Clayton and I am hear to talk about the cost of test.

Slide 2 please.



During this web-cast we will touch on five areas.

1st I will talk a little bit about the reason Cost of Test has become so critical.

2nd I will talk about the cost of test formula and the components that make it up.

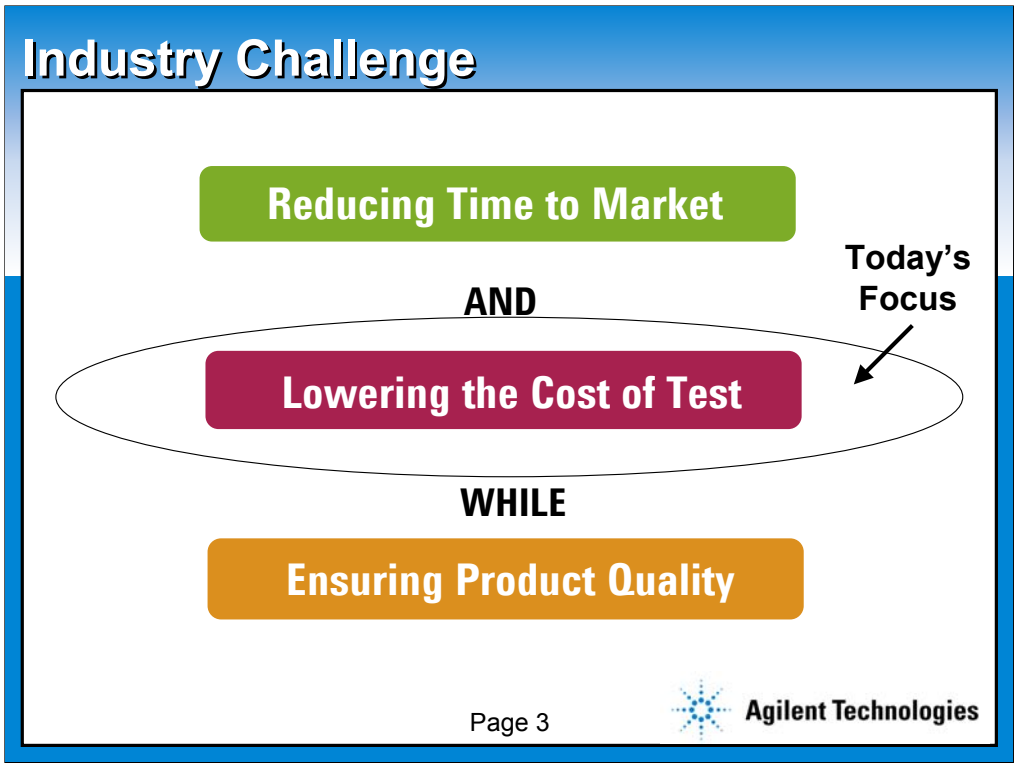
3rd I will talk about some of the bigger contributors to the cost of test and some ideas on how to improve them

4th I will have a brief discussion on Agilent's Cost of Test Analysis methodology

So that in the 5th section we can talk about a fictitious, but numerically accurate case study

There will be points in the presentation I will take questions.

So without further adue let's get started, slide 3 please

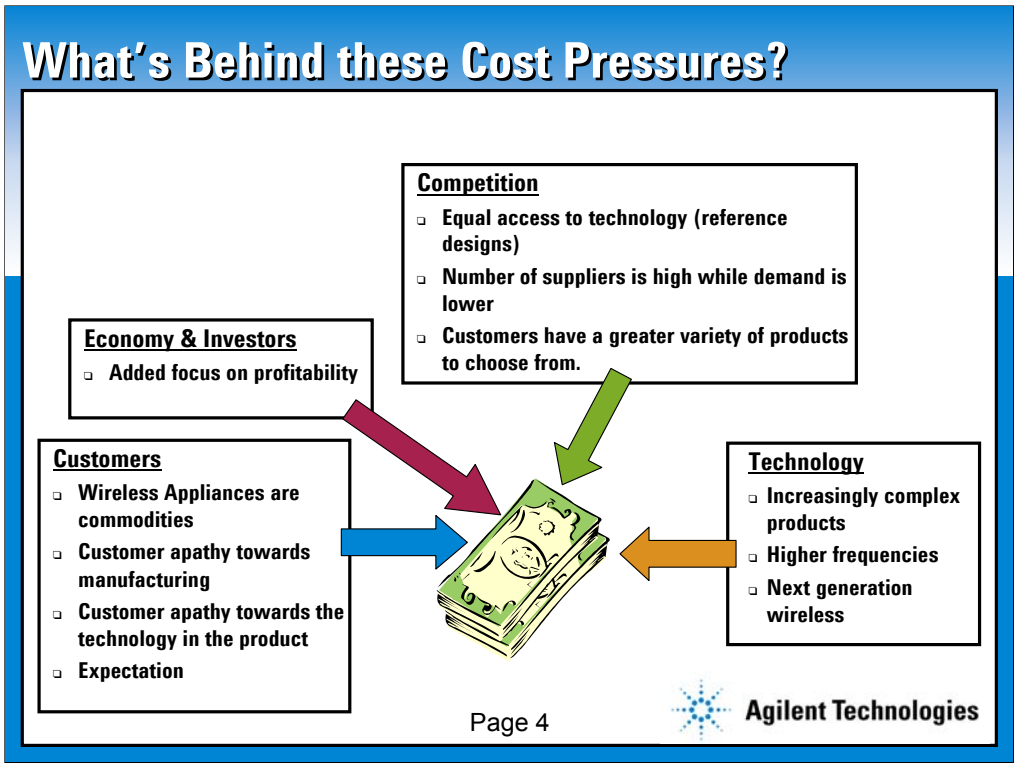


In today's difficult economic and competitive market the companies in the electronic and telecom industry are under enormous pressure to be profitable or return to profitability.

The challenge for the engineers is to introduce new products faster than the competition, at a lower cost than the competition while assuring the quality of the product going out the door is acceptable.

Not meeting one of these challenges doesn't make a company unsuccessful. It only makes the job more difficult. Agilent can help you be more effective in all of these areas, but today's web-cast focuses on the cost of test. The cost of test is impacted by the other two areas and will briefly touch on these as well.

So lets talk about the cost of test. Slide 4 please.



So what is behind these cost pressures?

I've classified some of the causes into four groups and I'm sure there are even more causes which gives credibility to the statement that the cost pressures are real.

The first of these pressures come from the customers

•As wireless appliances become commodities customers are more likely to seek the products with the best value. Meaning the most features for least amount of cost.

•Customers pay little attention to how or why a product works, but focus more on the look and feel of the product and how well the product works.

•And there is an expectation that electronic devices should get cheaper with time like televisions, vcrs and computers have for the past 20 years.

Second is the pressure from the shareholders of the company

•They want their investments to be profitable or they will cease to invest or worse they could divest themselves from the investment. This goes for startups as well as mature companies.

Third is the competition

•The playing field between competitors is getting more level. Technology is no longer a barrier for new competitors and is causing the number of suppliers to increase. This in turn gives the customers a greater variety of products to choose from when they looking for the best value.

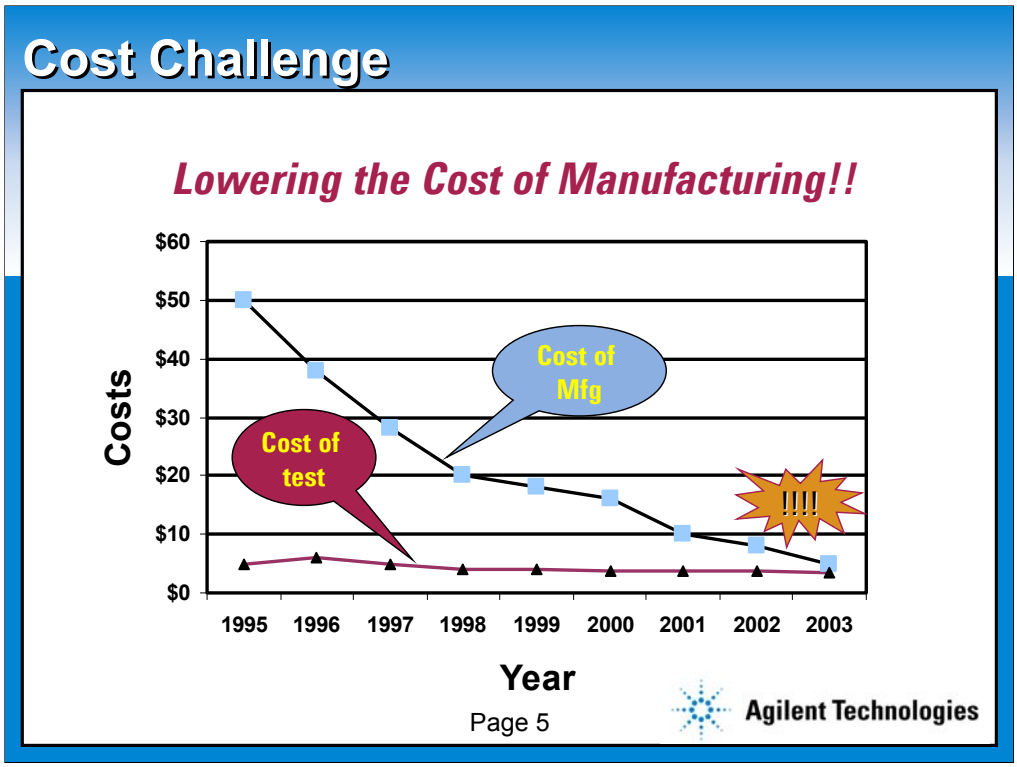
Finally, technology changes are adding to the cost pressure

•The products are getting to be more integrated like PDAs and phones in one package or cameras and phones in one package. Each having additional testing requirements.

•There are also new protocols and higher frequencies to contend with.

All of these are compounding the issues of reducing the complexity of test and improving the cost of test.

Slide 5 please.



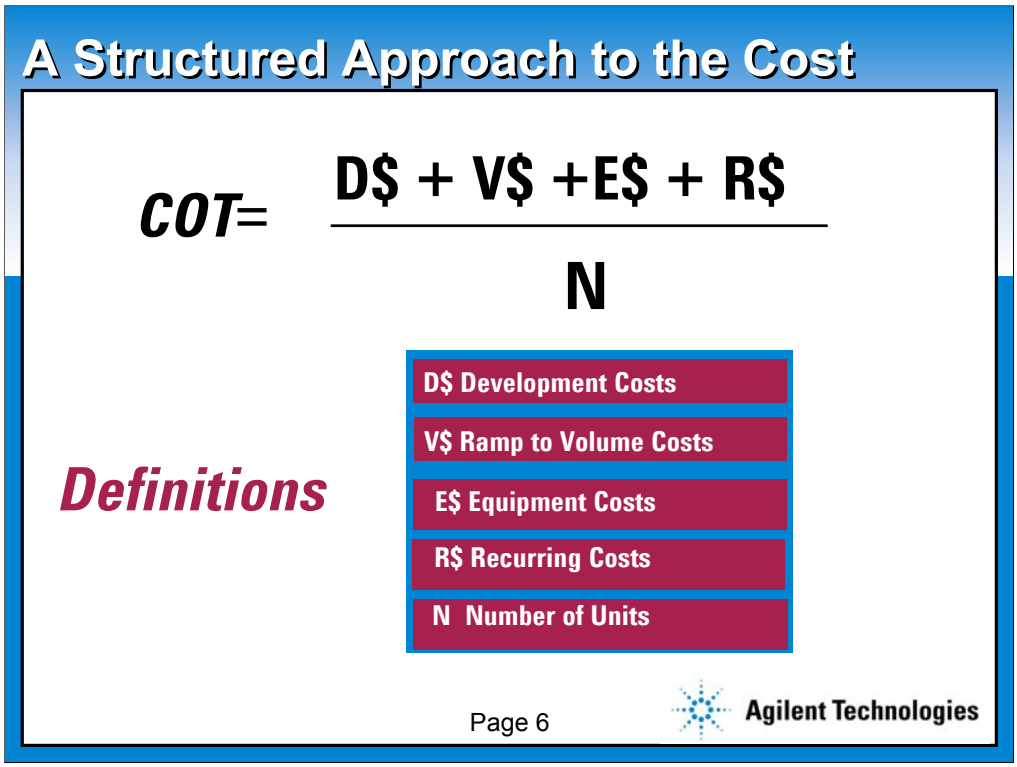
So why are we here? I presume that many of you are experiencing or believe you will be experiencing pressure to reduce the cost of test for your products. As mentioned before, this has been the prevailing trend for electronic devices for decades. In the wireless industry, major strides have been made in reducing the overall cost of manufacturing. This has come predominantly through reductions in assembly costs, in both final assembly and surface mount assembly. This is due to the reduction in the part count, the design of more producible products and improvements in the tools used. Also, because the volume have grown so rapidly the ability to gain significant economies of scale has been achieved.

But what about test costs? Over this same period of time the complexity of the products has increased dramatically causing the need for more complex testing. The impact this has had on test is that more testing is actually being done today than in the past. But through improvements to the test equipment, software programming, the built in test capability of products and because of the economies of scale that are achievable with volume the average cost of test has also declined, but very modestly when compared to the assembly costs.

This argument of increasing test complexity is no longer acceptable and significant efforts must be made to reduce the overall cost of test. This needs to be accomplished before test becomes the dominant component in the overall cost of manufacturing.

I'm going to talk about this and help you to understand what makes up the test costs, because only by understanding these can you systematically improve your test costs.

Slide 6 please.



So here is the mathematical formula I use for determining a companies cost of test. The components are identified based on the product life cycle. Progressing from Development to production. The components that make up the formula are:

•The Development costs or the costs to develop the complete test solution.

•The Ramp to Volume costs or the costs to deploy the complete test solution and to ramp the capacity to meet the capacity required for production.

•The cost of the test equipment.

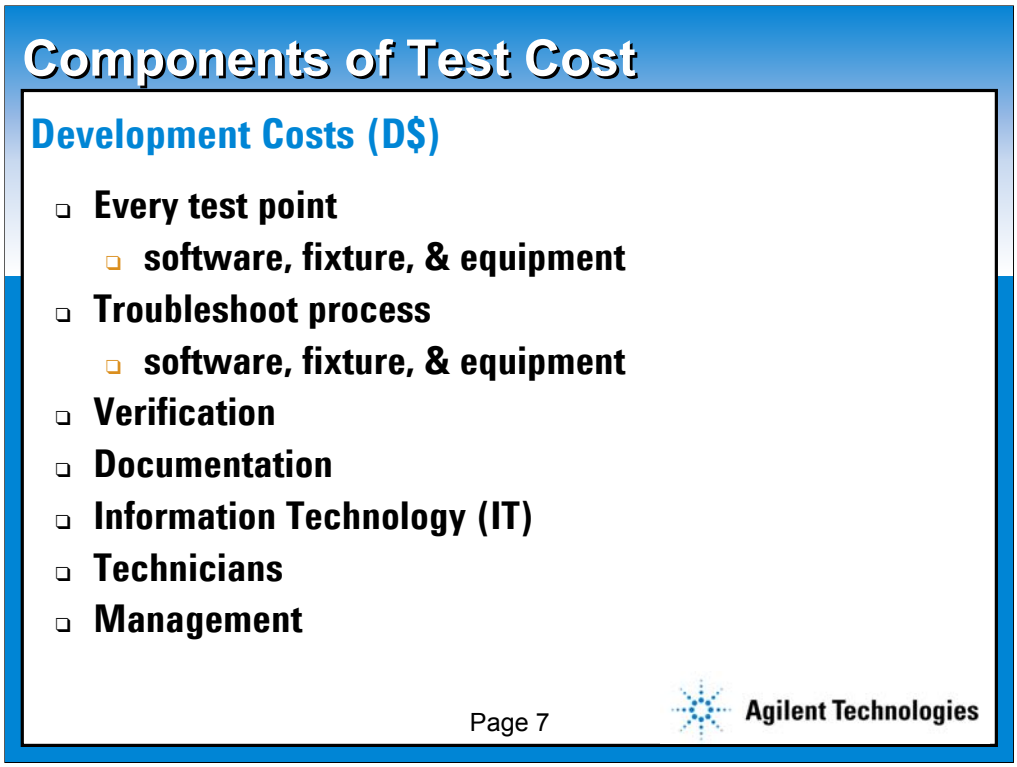
•The recurring costs or production costs of manning and maintaining the test solution.

•And the number of units

The units of measure this formula yields is cost per unit. You can figure out what your company spends on test by only adding up the variables in the numerator, but not taking into account the volume can either scare you with a big total cost or give you a false sense of security with a small total cost. Therefore, I recommend that you look at the cost per unit to get the best feel for how your test operation runs.

So let's talk briefly about what goes into these 5 variables.

Slide 7 please.



Development costs.

•This is the cost to develop every test point. Including software development, fixture development, equipment training or even the development of specialized equipment.

•The same is true for the troubleshoot process which is included as part of the test process.

•There is some effort spent on verifying the test solution and ensuring the quality of the test results is good.

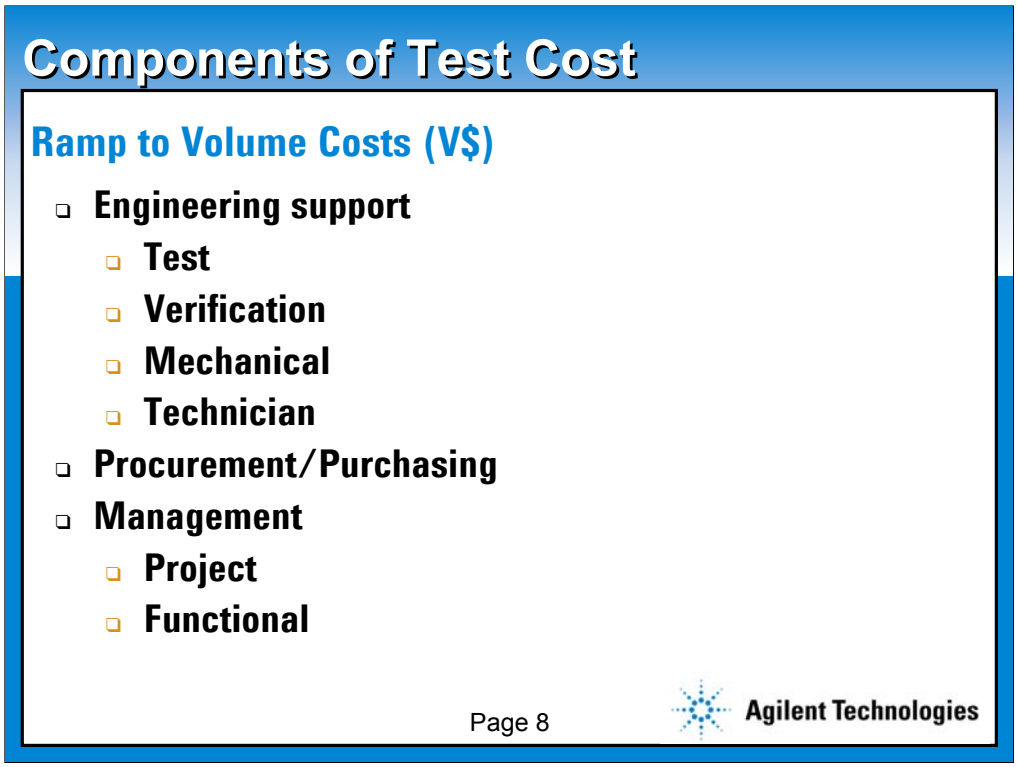
•Documentation is needed for the continued maintenance of the test solution. This is especially true when the production environment is remote from the development site.

•Effort is spent developing the Information technology solution to support test. This includes managing test plans and test results and providing constant connectivity between the equipment and the network.

•Technicians are used to support the engineers.

•Management includes the functional managers for the people involved in test and the project managers involved in managing the test aspect of their individual projects. Higher levels of management or other support functions like HR and finance are not broken out, but are included in the overhead rates that eventually get applied to the hourly rate for all of the individual contributors and first line managers.

Slide 8 please



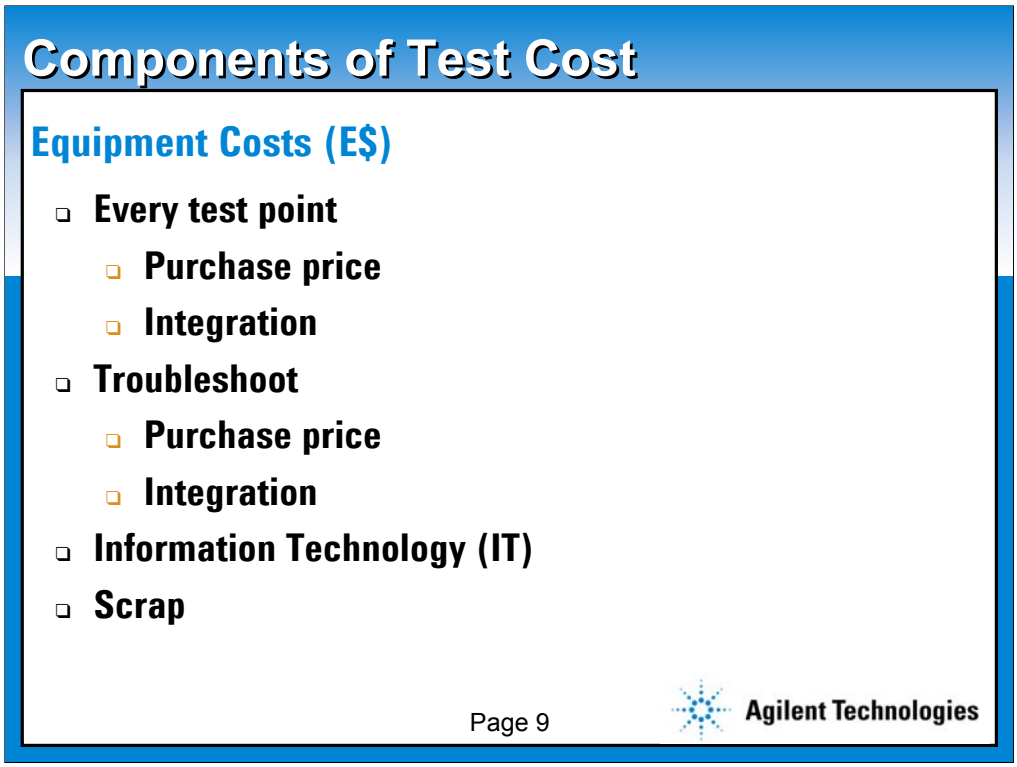
Ramp to Volume Costs include:

•The costs of the engineers to support the transition from the product development phase to high volume production.

•Procurement or purchasing effort accounts for the time and energy spent managing suppliers, buying and tracking the test equipment purchases, and coordinating material delivery for off-site integration services.

•And again there is a management component for the functional managers and project managers.

Slide 9 please.



Equipment costs, including the manufacturing test points and troubleshoot, are broken down for every test point and include the purchase price of the equipment and any external costs of integration. The cost of the equipment is broken down into two categories. The first is expense meaning that the equipment has a relatively short lifespan and will only be amortized over the life of the individual product. The second is capital meaning that the equipment has a use beyond the individual project and can be reused. Typically, capital equipment is depreciated and tracked by the Finance group.

The cost of the information technology equipment specifically used by the test process is also accounted for.

Scrap costs of the equipment is also accounted for. Scrap costs come into play when the useful life of the capital equipment is less than the depreciation schedule and the equipment is disposed of before the equipment is fully depreciated.

For example, if you have a product line that requires a special piece of test equipment. That piece of equipment costs $25,000, is categorized as capital equipment and put on a three year depreciation schedule. Unfortunately, the product line only is in production for one year and hence the equipment becomes obsolete. In this scenario the equipment still has 2 years of depreciation life remaining on it. The remaining 2 years of un-depreciated value of the equipment then becomes the scrap cost of the equipment.

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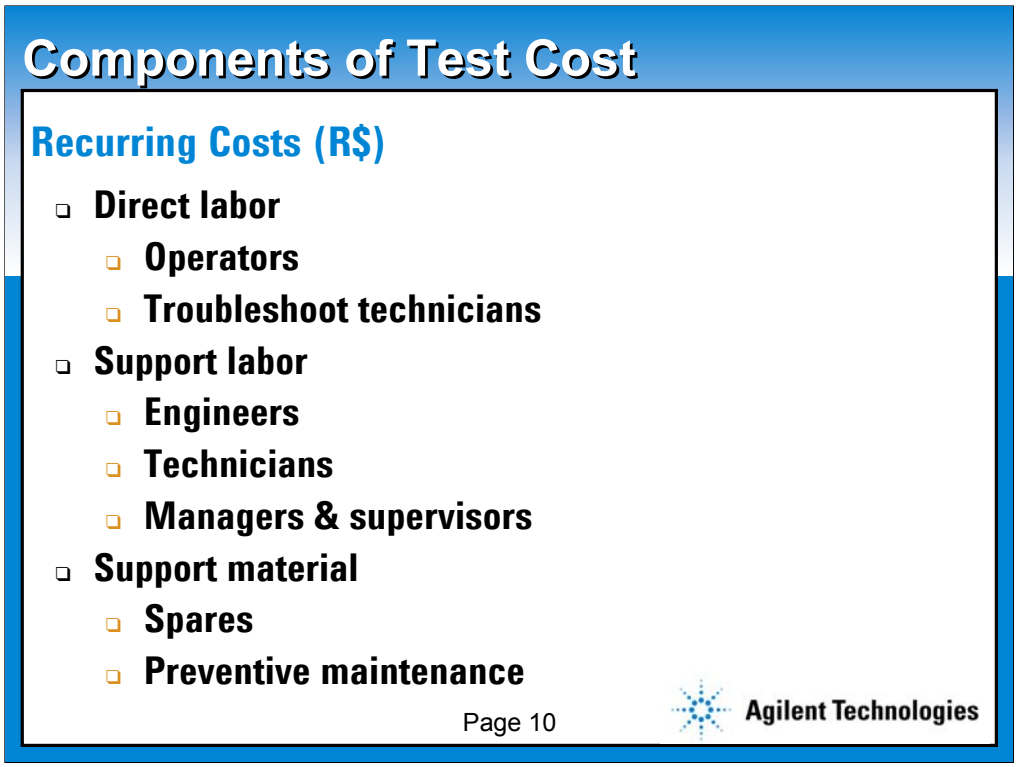
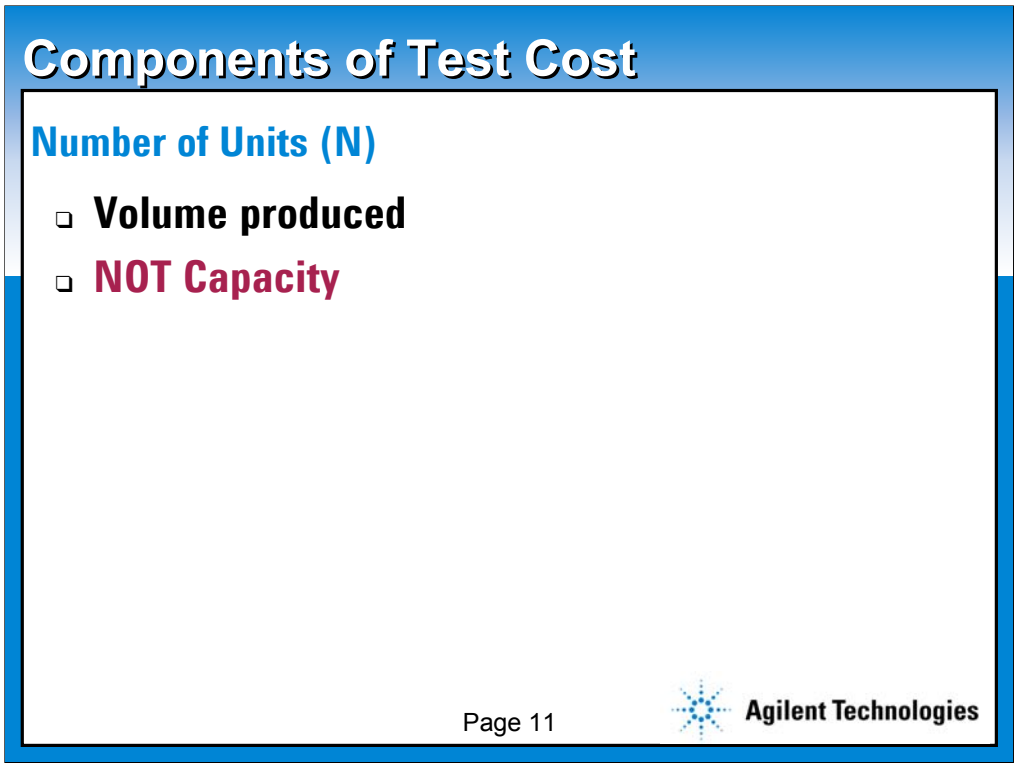


The recurring cost is the test costs incurred during the production phase of the product. It includes the obvious in the test operators and troubleshoot technicians.

It also includes the less obvious costs of support. This includes the engineers that are doing enhancements to the test solution and making changes to accommodate changes in the manufacturing process or the product. This component also includes the factory support technicians who maintain the test solution on a daily basis. And again, there is an cost associated with managing and supervising the people involved in manning and supporting the test solution.

Finally, there is a cost associated with having spare parts and equipment and in having the material to do preventive maintenance.

Slide 11 please.



The final variable is the number of units

It is important to remember that it is the volume produced. Using the capacity of the test equipment is inaccurate because in the event the capacity is not met everyday then the cost can not be amortized over the correct number of units produced and will give you a falsely low cost per unit.

In other words, only units produced have a cost and these units must bare the brunt of paying for all the costs no matter what capacity is.

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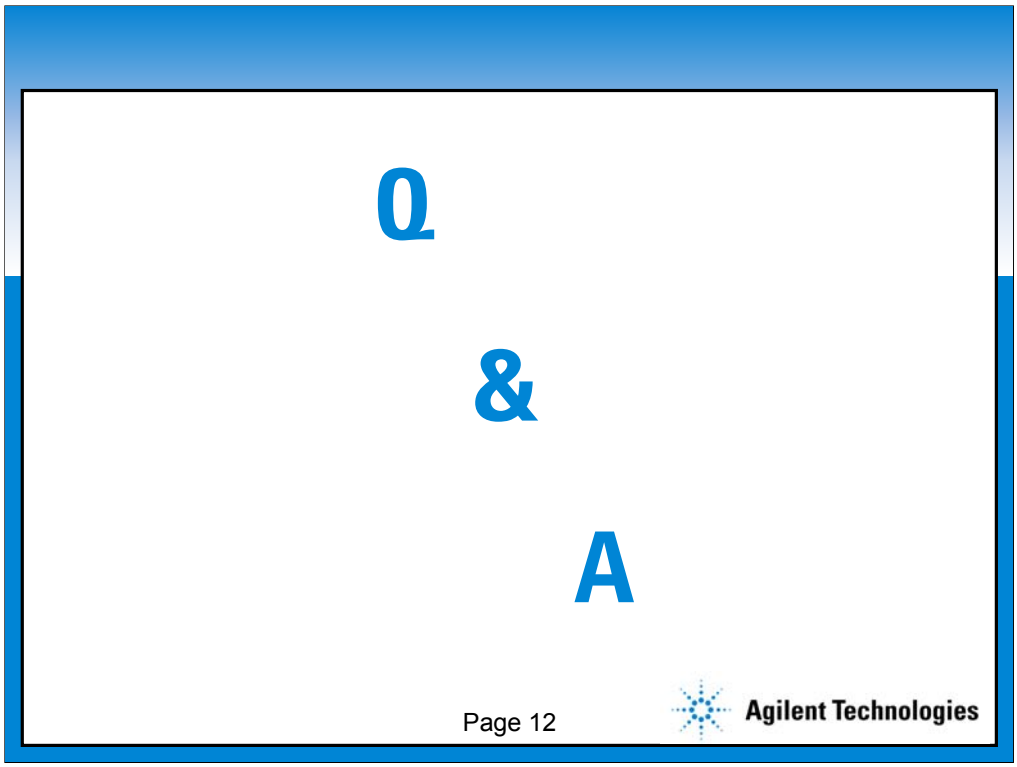
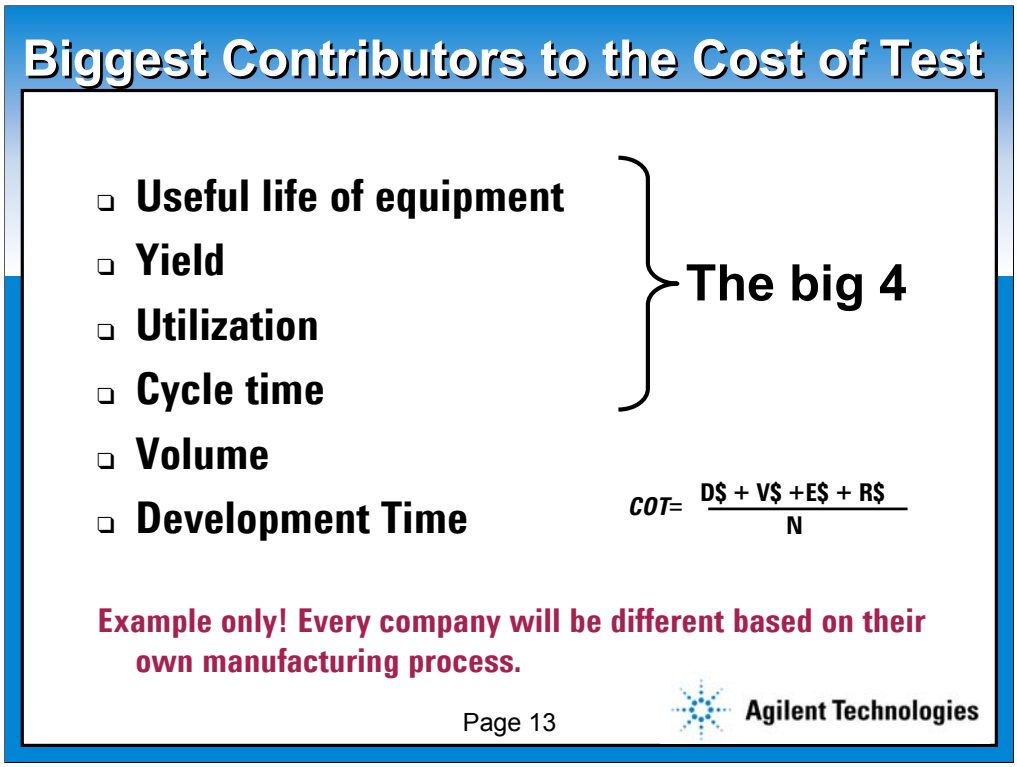


At this time I am ready to take any questions from the audience.

Okay, if there are no other questions then lets keep moving.

Slide 13 please.



Let's now talk about some of the contributors that cause the variables in the cost of test formula to change. These include what I call the Big 4 and include:

•The useful life of the test equipment

•The yield of the individual test points

•The utilization of the test solution

•The cycle or test times of the individual test points

Other contributors include:

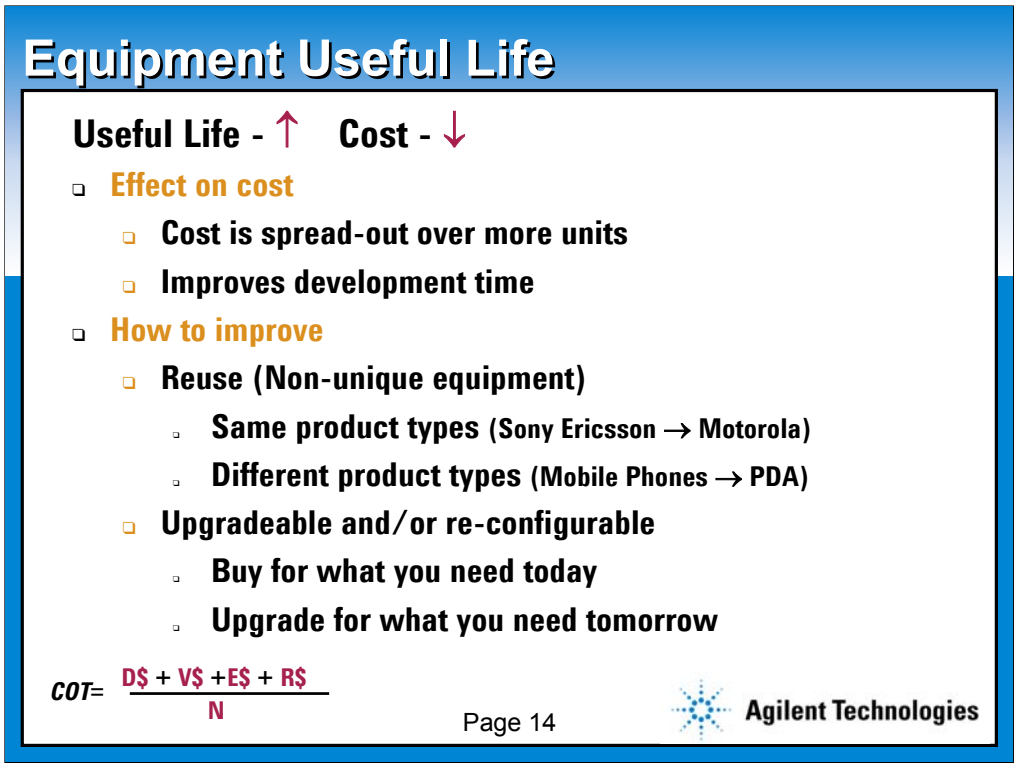
•The volume produced

•And the amount of time it takes to develop a test solution.

It is important to know that these are typically the biggest contributors the cost of test. There are others and depending on the manufacturing process deployed by a company some will have a greater or lesser impact on the cost of test.

Over to the right is the cost of test formula described earlier. On each of the following pages you will see this formula again. Variables that are affected by the contributor will be highlighted in red so you can see what portion of the equation is being affected.

Slide 14 please.



Let's start with the useful life of the equipment. Useful life does not just mean the equipment is operational. It means that by taking into account all of the variables associated with test including, the time required to perform the tests, accuracy of the measurement, variability of the test results and the functionality of the equipment, the equipment is still a cost viable solution.

As the useful life of the test equipment becomes longer the cost of test decreases. This is caused by the fact that more units can and are produced over the life of the equipment. This causes the cost to be spread out over more units and from the cost of test formula N is increased.

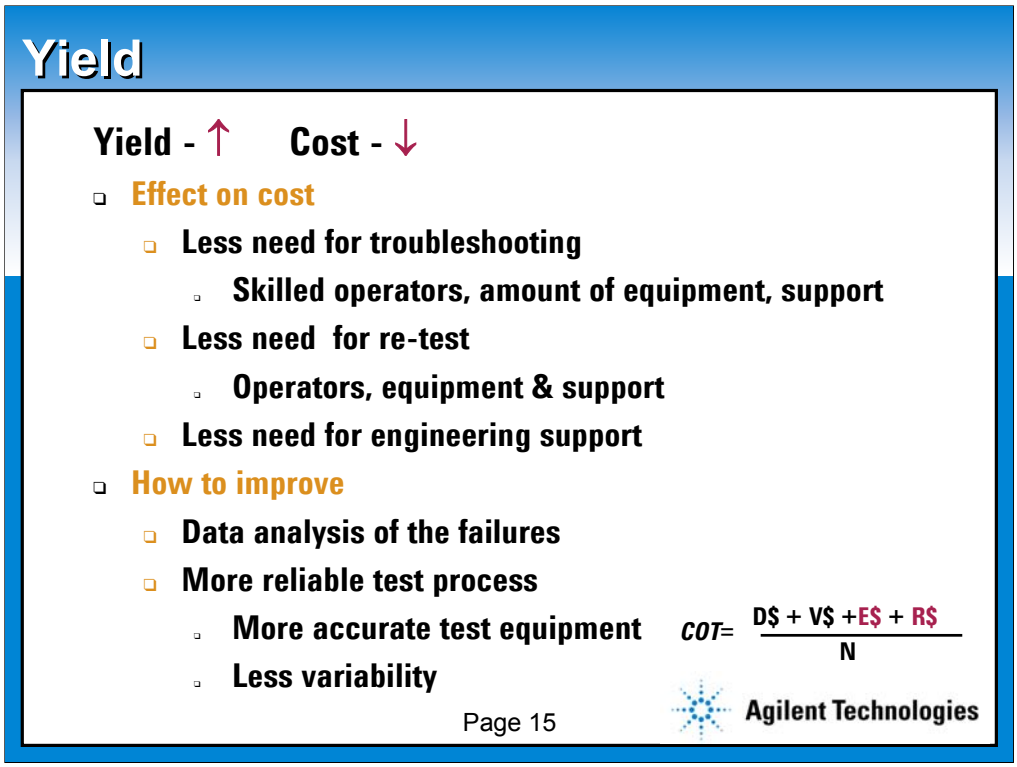
Also, equipment that is more familiar to the developer is typically easier to understand and develop solutions with. This has the same impact during the ramp to volume and production phase of the product life. Equipment that is more familiar to the operators, support engineers and technicians is typically easier to understand, run and support. And from our cost of test formula D, V, E and R are all decreased.

How do you improve the useful life of the test equipment?

- First is purchasing equipment that is reusable. Meaning the equipment is not unique or has multiple applications. Contract manufacturers have an opportunity to use their test equipment across multiple customers products and across different product types (like mobile phones, PDAs or PCMCIA cards). OEMs have the opportunity to use their test equipment across similar product lines (like different mobile phone products) and if their company produces different product types they can use the equipment across these.
- Second, is by purchasing equipment that is upgradeable or re-configurable. This gives you the opportunity to buy what you need today and when the future requirements arise, upgrade or re-configure your test equipment.

Products that include these attributes are multifunction power supplies, the Agilent 5515C RF Test set, and the E8421A Test fixture that can be reused and are quickly re-configurable for multiple applications.

Slide 15 please.



Yield is another big contributor to the cost of test.

As the yield increases the cost of test decreases.

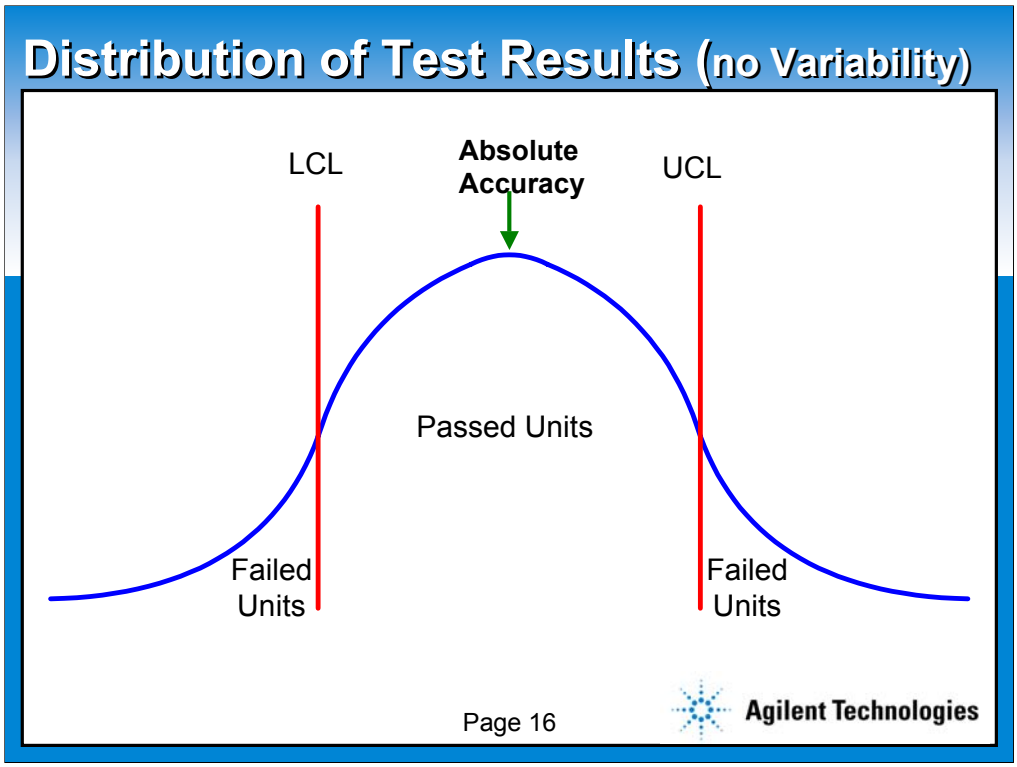
This is caused by the fact that with higher yields there is less need for troubleshoot and less need for re-work and less need for re-test. This is very important because many people grossly underestimate the cost troubleshoot plays in the overall cost of test which in many cases causes yield to be greatest contributor to the cost of test.

How do you improve yield?

Yield is very dependent on two factors the assembly process and the test process. Assembly process defects must be constantly analyzed and **feed back** must be given to the equipment or people causing the defects. Real-time data monitoring and analysis is critical. Agilent has developed several tools that allow you to monitor and analyze test results and can assist you in deploying a solution if your yields are below where you want them to be.

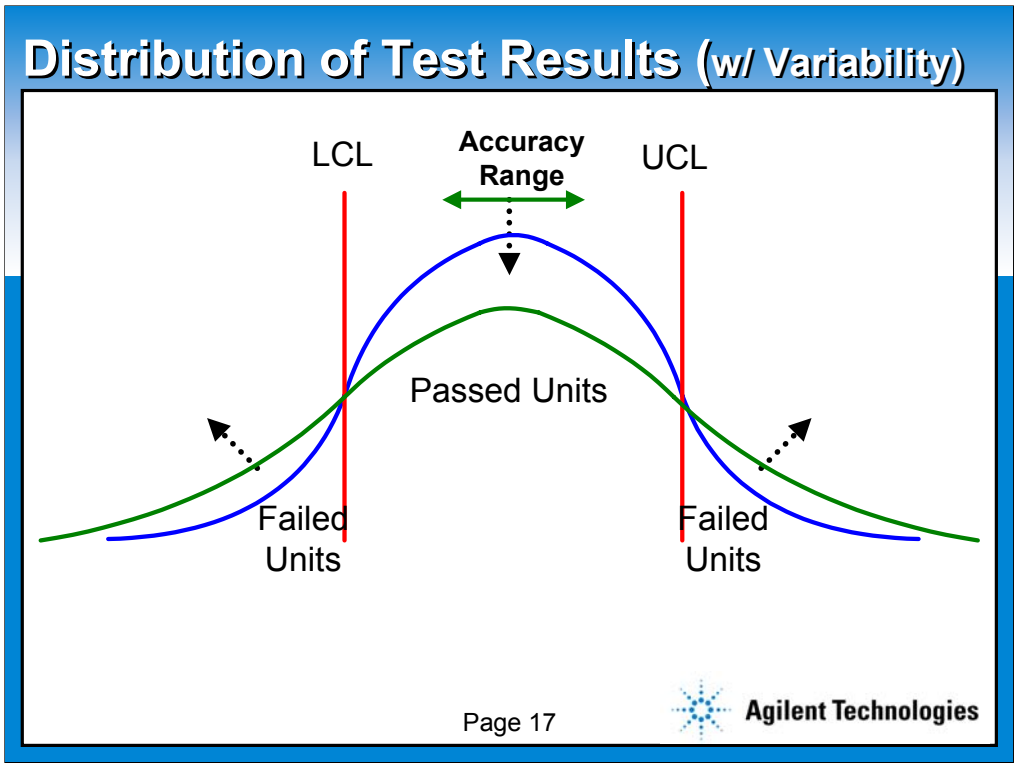
Test process defects are identifiable as No Trouble Founds or test escapes. These are caused by defects in the test solution like cable wear out. These are usually easier to resolve than accuracy and variability issues that often accompany cheaper, less reliable test equipment. Let's briefly talk about variability and accuracy.

Slide 16 please.



In this graph the results of a test is a normal gaussian curve. The red lines signify the lower and upper limits of the tests. Units that measure between these limits pass and those outside the limits fail. With the test solution having no variability and absolute accuracy, the distribution will solely be based upon the variability of the units tested.

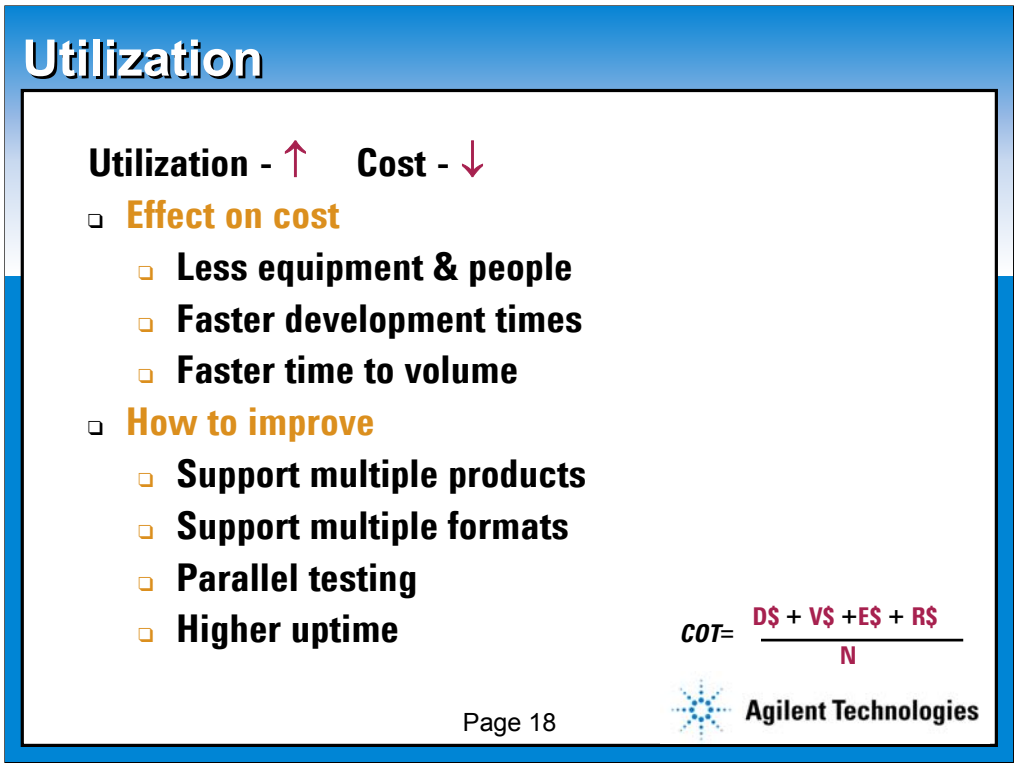
Slide 17 please.



When the test solution used in the test has variability and is not accurate the distribution of the test results is flatter, spread out more and shifted off of the absolute accuracy point. This could causes units on the fringe of the limits to fail falsely, an NTF, or to pass falsely, an escape. NTFs cause the cost of test increase. Escapes can also cause a higher cost of test, but more damage is done to the reputation of a company when an escape makes it into the customer's hand.

Therefore, when evaluating an instrument or test solution it is as important to include accuracy and variability in making a decision as is the purchase price. Purchasing the cheapest test equipment can be a one time savings, but when you factor in the cost incurred with poorer yields or bad customer relations this savings is quickly consumed and your total cost is higher.

Slide 18 please.



Utilization of the test solution also has a big impact on the cost of test.

•As Utilization increase, more units are produced and the cost of test decreases. OR

•With a higher utilization of the test equipment in production it causes the need for less equipment and people to man and support the equipment and the COT is improved.

•With a higher utilization of the test equipment during development of the test solution, the time it takes to develop a solution can be improved and the COT is improved.

•And With a higher utilization of the test equipment during the ramp to volume phase, the faster a production line gets to its stated capacity the COT is improved once again.

How to improve utilization?

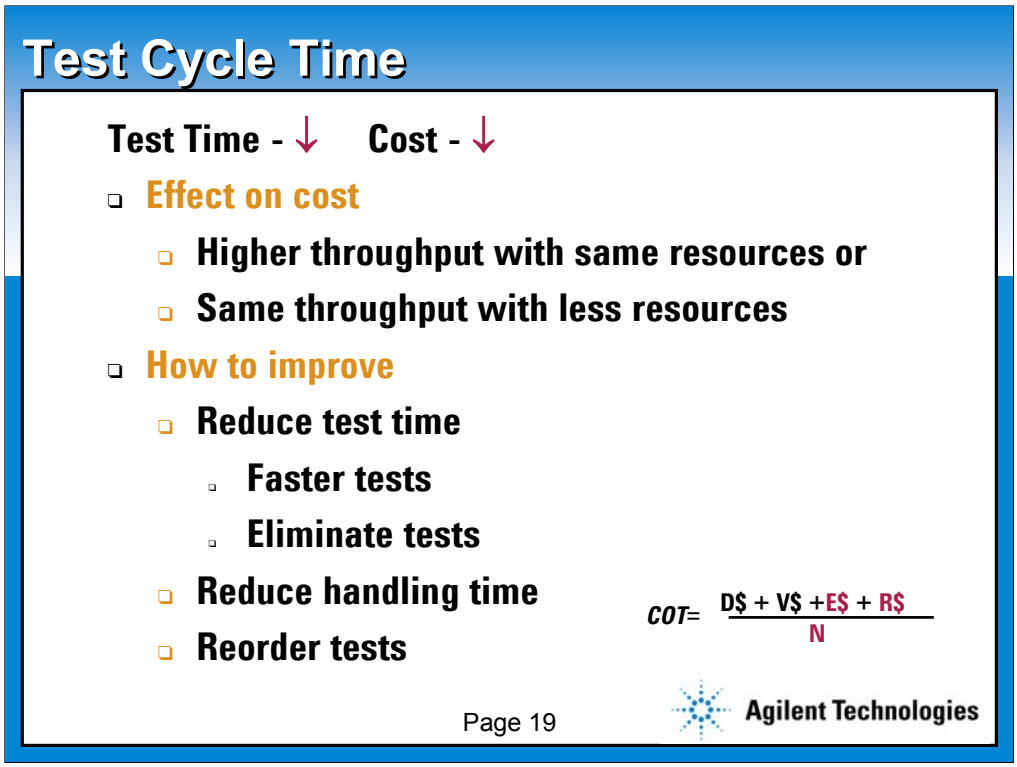
Besides the obvious answer of making sure the test solution is always running there are other methods to improve utilization. These include:

•Ensuring the test solution support multiple products so if one product diminishes in demand when another is increasing, the equipment can be quickly moved to that production line. Using a standard platform like the Agilent N4052A across several product lines allows you to quickly move the solution around.

•Many times products have similar mechanical design but use different formats like GSM and CDMA. Using test equipment that supports multiple formats allows a production line to produce both products and increases utilization. Using the Agilent 5515C with several formats installed allows the user to accomplish this goal.

•Parallel testing allows equipment to be shared between two devices under test. This may cause equipment prices to increase by having two fixtures or more complex cabling and switching, but through increases in the utilization of the shared test equipment the overall cost of test is decreased. Agilent's Custom Solution Organization has done this type of work in the past and helped our customers to be more successful in lowering their cost of test.

•Higher uptime means the test solution is available more minutes of the day. The reliability of the solution is critical in maintaining a higher time. Less time spent calibrating, or performing PM allows for more units to be produced.



Test time is the last of the big 4 contributors.

With lower test times you incur a lower cost of test.

By lowering ones test time two things are possible.

•If demand warrants it, you can produce more units with the same amount of equipment and people and increase N from our COT equation.

•Or if demand does not increase, you can maintain the current volume and deploy less equipment and people thereby improve E and R in the COT equation.

Both of these improve the Cost of test.

How do you improve the test time?

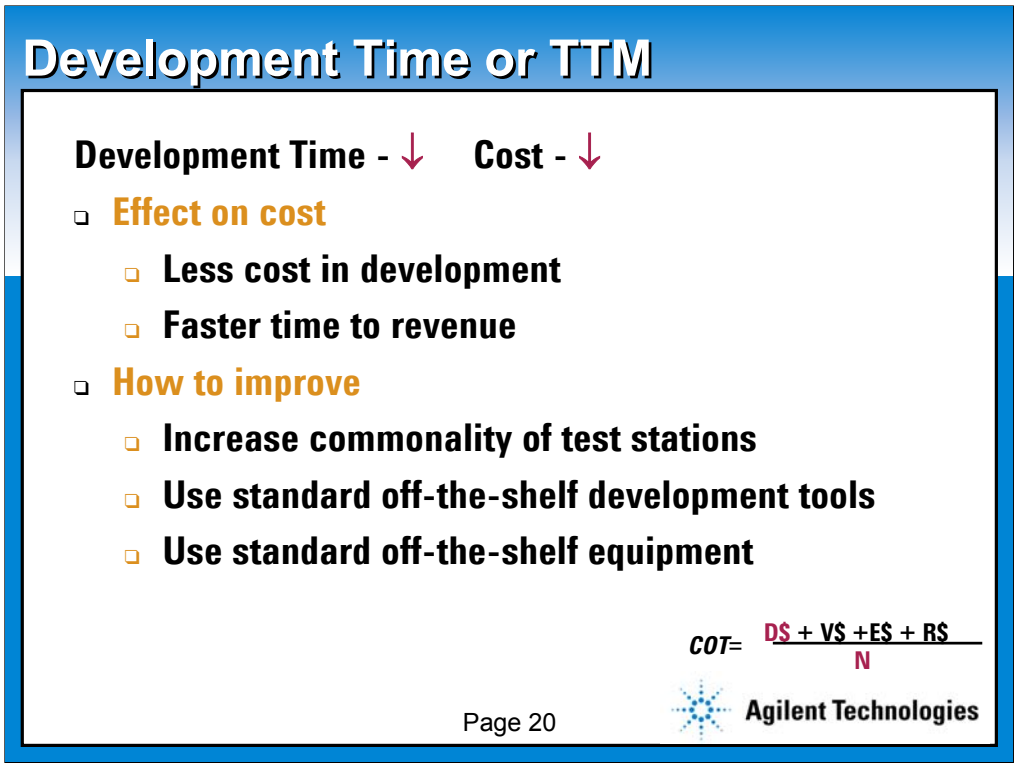
The obvious answer is to reduce test time. This is accomplished by either testing faster or testing less. The use of more expensive test equipment with a faster test time can actually pay for itself very quickly.

The not so obvious answer is to reduce the handling time. Deploying fixtures like the Agilent E8421A with a quick connect capability can allow handling times to be reduced by upwards of 75%. A savings that quickly pays for the cost of the fixture.

Another way to reduce the amount of time spent on test is the efficient ordering of the tests. This is done to decrease the equipment and DUT setup times, but also to move high failing tests to the front part of the test plan so they can be identified earlier.

All of these improvements plus some of the yield improvements are part of test optimization services Agilent offers to help our customers improve their cost of test.

Slide 20 please.



Much of the overall cost of test is determined by the decisions made during the development phase of the products. Even though development time contributes very little to improving the cost of test, the solutions that are developed or purchased have an enormous impact on the useful life of the equipment, yield, utilization and test times as we have mentioned in the previous four slides. But there is still a cost associated with doing development that can be improved upon and by lowering the time it takes to develop a test solution less cost is incurred.

If test is in the critical path of bringing a product to market, than any reduction in the development process allows a company to bring its product to market earlier and reap the rewards associated with being first to market.

How do you improve the time it takes to develop a test solution?

•First is the idea of having a common basis to the different test stations. As functionality is needed the basic solution is customized to meet this need, but the foundation of the solution was pre-developed. This applies to both the hardware and software.

•Second, is the use of off-the-shelf development tools. Instead of spending time developing tools that can then be used to develop test solutions, standard tools are readily available that allow the test developers to concentrate on the task of developing solutions.

•Third, is the use of off-the-shelf equipment. Many times people will rationalize that they can develop a solution cheaper than can be purchased. Once you take into account the time and energy of doing all of the work, including documenting, building, integrating, check out and support it is seldom that this is actually true. On top of these costs is the lost opportunity costs. One must ask "what else could I have been doing that would have returned more for their company and perhaps even have paid for the "off-the-shelf" solution".

For these reasons Agilent has dedicated their resources to develop and offer the N4052A and E6560A as building blocks for both hardware and software to enable our customers to have standard tools and equipment that help our customers reap the benefits associated with our economies of scale.

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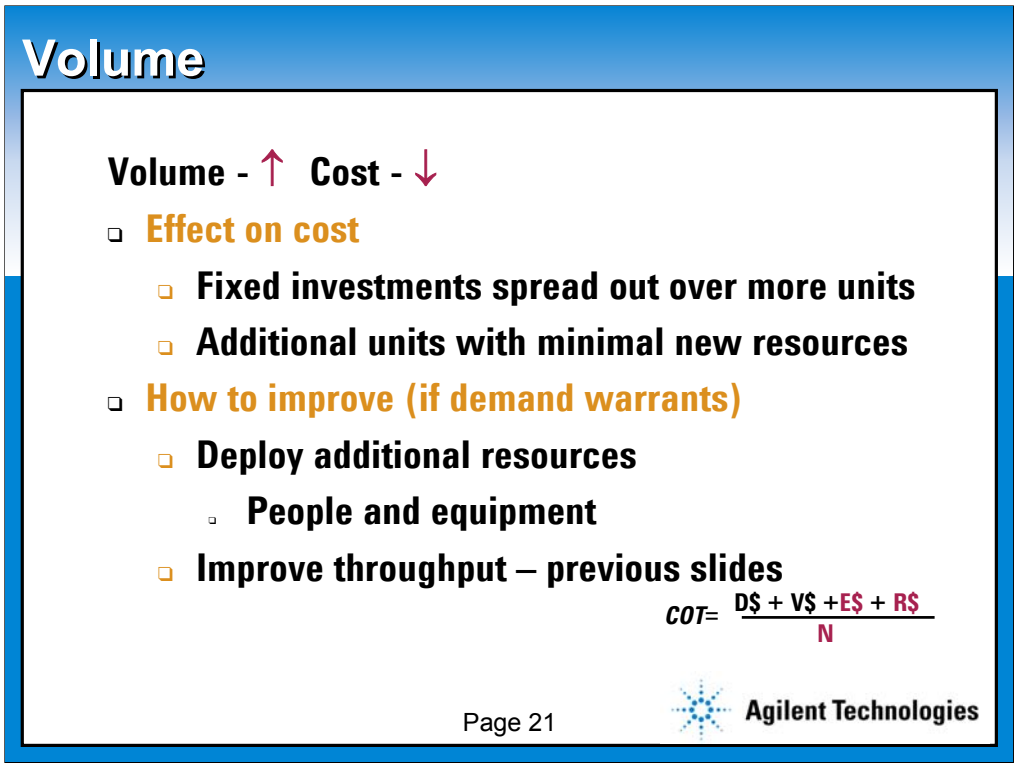


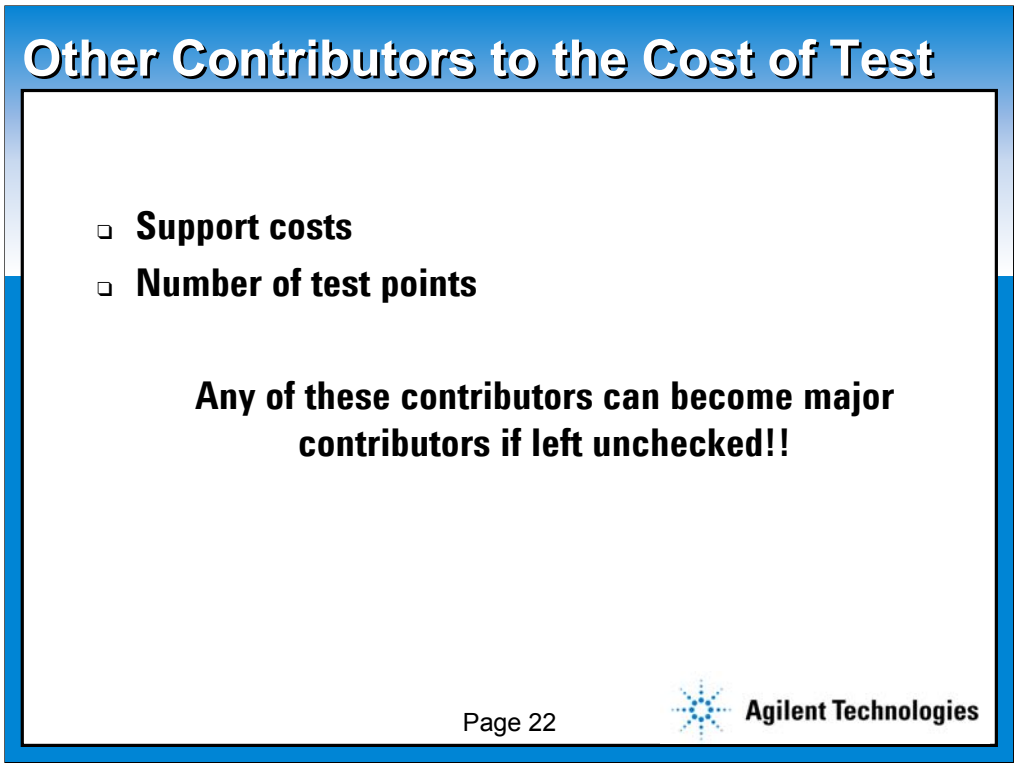
Finally there is volume. As volume increases cost typically decreases. Volume allows a company to minimize the cost of their fixed assets by spreading them out over the most units.

Eventually you reach a point where an increase in volume doesn't have a corresponding impact on the cost of test. At this point the need for improving the contributors mentioned in the previous slides is the primary method for decreasing the cost of test.

If the volume is not maxed out for the equipment and people deployed then additional units can be produced without the need for any additional investments.

If the volume is maxed out based either more resources, including people and equipment, need to be deployed and purchased or improvements in the contributors mentioned in the previous slides is needed. The later reduces the cost of test and achieves the needed volume increase. Straight capacity increases does little to improve the cost of test, but does allow your to meet the volume commitment.

Slide 22 please



I do want to mention two other contributors to the cost of test that typically are not major contributors, but can become major if you don't manage them correctly. These other contributors are:

•Support costs and

•The number of test points

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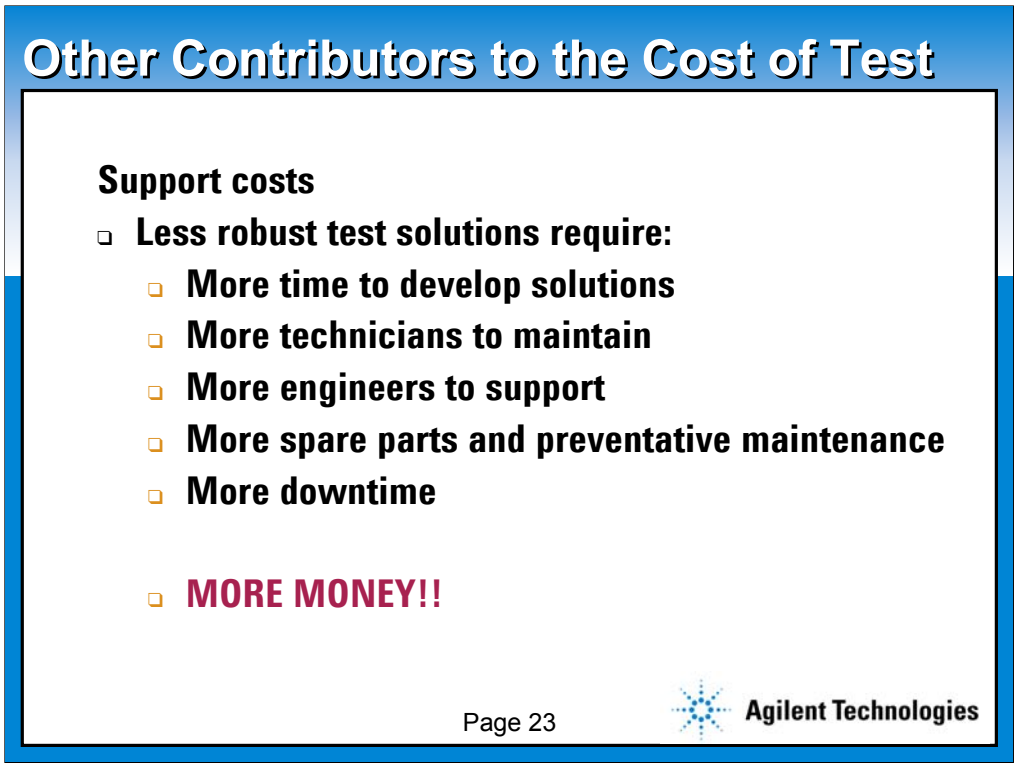


Higher support costs arise when a solution is not very robust. Meaning:

•It takes more time to develop the test solution

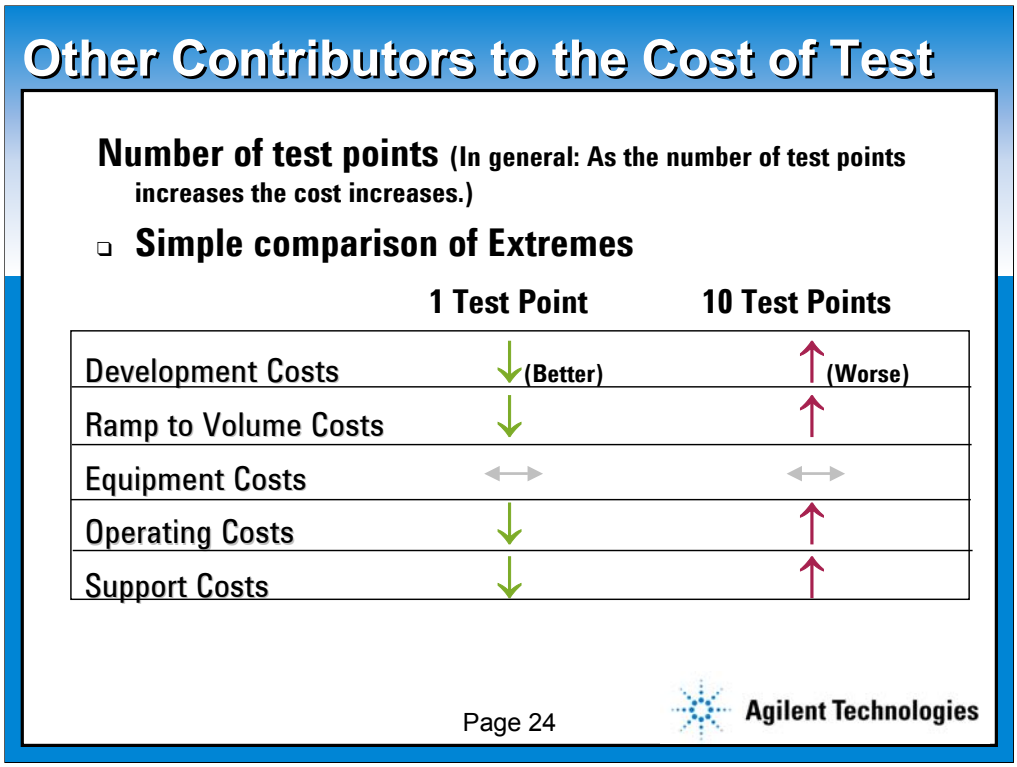
•It takes more technicians and engineers to deploy and support the solution

•It takes more spare parts on the shelf and scheduled PM to keep the solution running AND

•It has more down time for PM, spare replacement or just debugging failures

•In essence less robust solutions increase the cost of test by requiring more support

Slide 24 please



The other contributor that can become major is the number of test points.

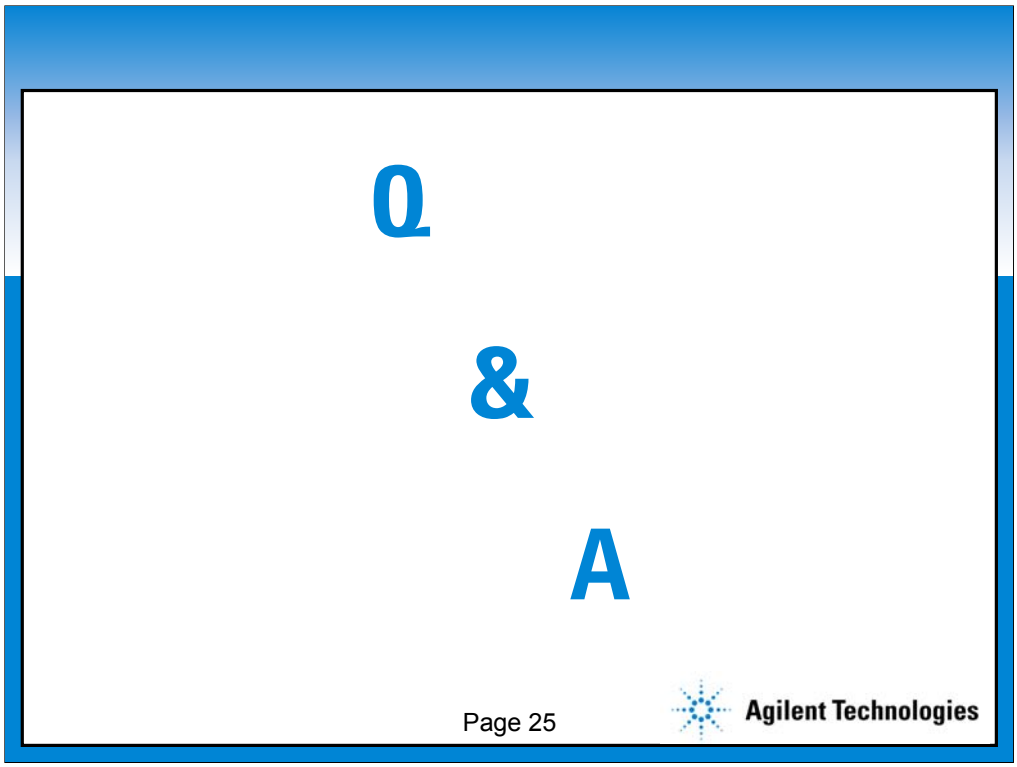
In this Table is an example of extremes. Besides having zero test steps, it is safe to say that somewhere between these two extreme examples is the optimal solution. The important things to remember are:

•That a non-optimal test process will cost you more money

•Test must be considered an integral part of the manufacturing process and

•Any optimization to the overall manufacturing process must consider the impact it has on the cost of test and vice versa.

Slide 25 please.

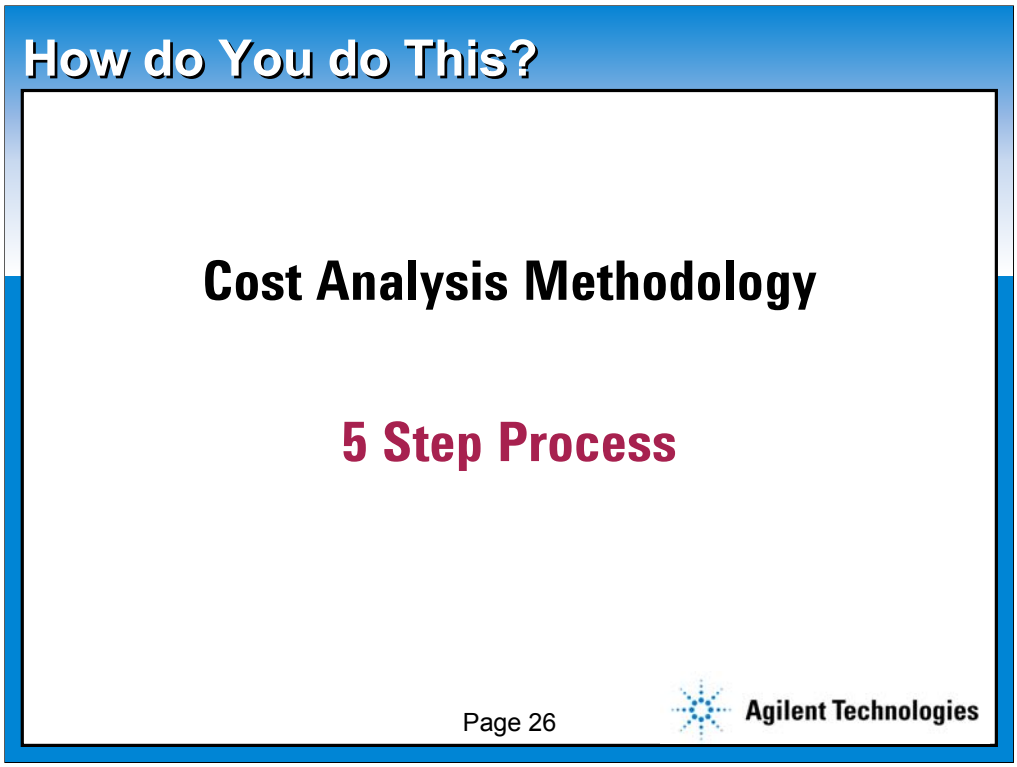


At this time I'm ready to take any questions from the audience on the material presented so far.

Q&A

Ok then let's continue.

Slide 26 please.



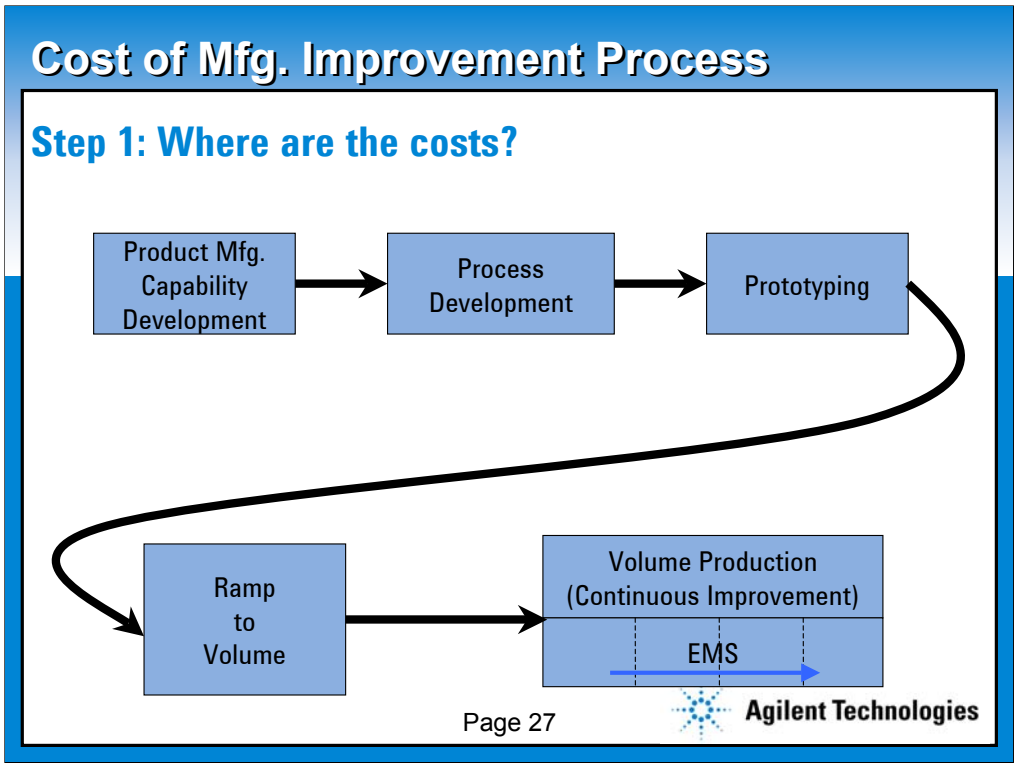
Hopefully by now I have intrigued you enough to ask how we have come up this information or how it can be used for your benefit.

Unfortunately, every manufacturer is different in some or many ways and generalizations are not accurate.

Fortunately though, there is a methodology that allows Agilent to work with you to analyze your cost of test and allow you to make improvements. While the methodology can be deployed by anybody there are several tools used by Agilent that make quick work of this analysis so that efforts can be focused on the improvements.

The next section briefly talks about this methodology and is the basis for the case study given at the end of the presentation

Slide 27 please.



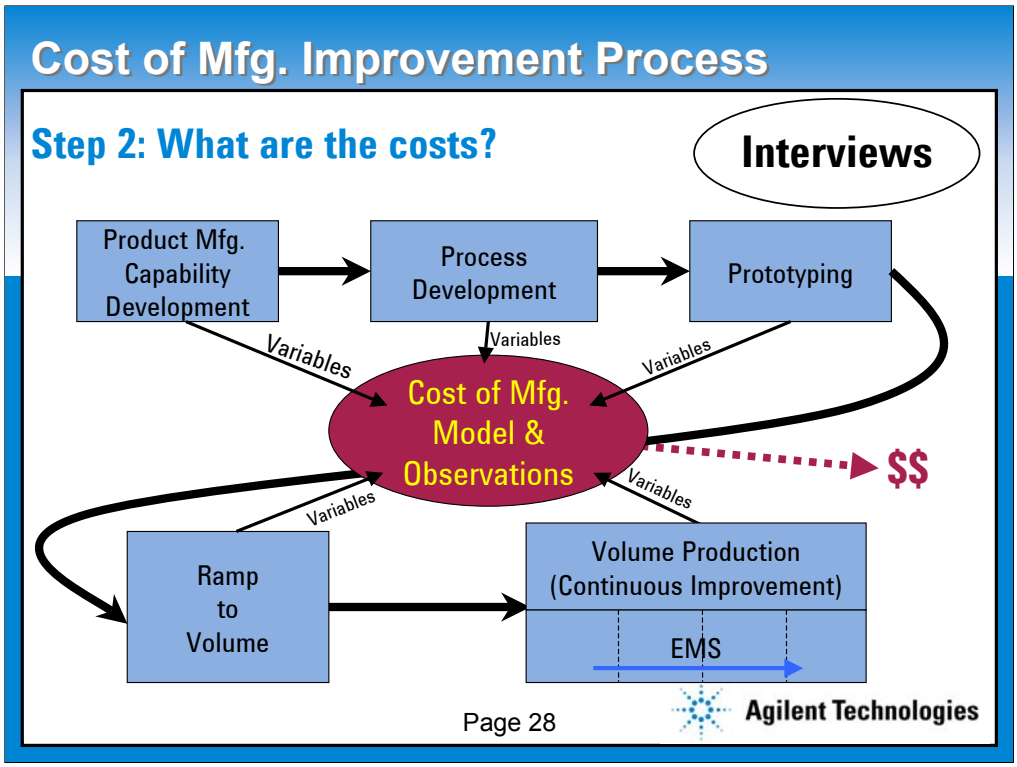
The first step in the process is to identify where the costs are.This step is basically already completed unless during the analysis other previously undiscovered areas of a cost in the product life cycle are uncovered. These areas as mentioned in the previous slides are:

•The development phase including the development of the product and the process and any prototyping

•The ramp to volume phase including the acquisition of the production equipment

•And the volume production phase.

Slide 28 please



Now that we know where the costs are we need to know what the costs are.

By conducting a series of relatively quick interviews and through our own observations we apply the different variables to a cost of manufacturing model developed for Agilent that first breaks down the costs into the different manufacturing elements, Surface mount, test and assembly.

Then it breaks these costs down even further into the contributors that make up the different elements, like yield, test time and utilization for test.

It is important to know this model can be deployed on a macro scale to include surface mount, test and assembly or on a micro scale with any combination of these elements or just an individual element.

The importance of this step is to baseline the current or proposed solution so that improvements can be measured.

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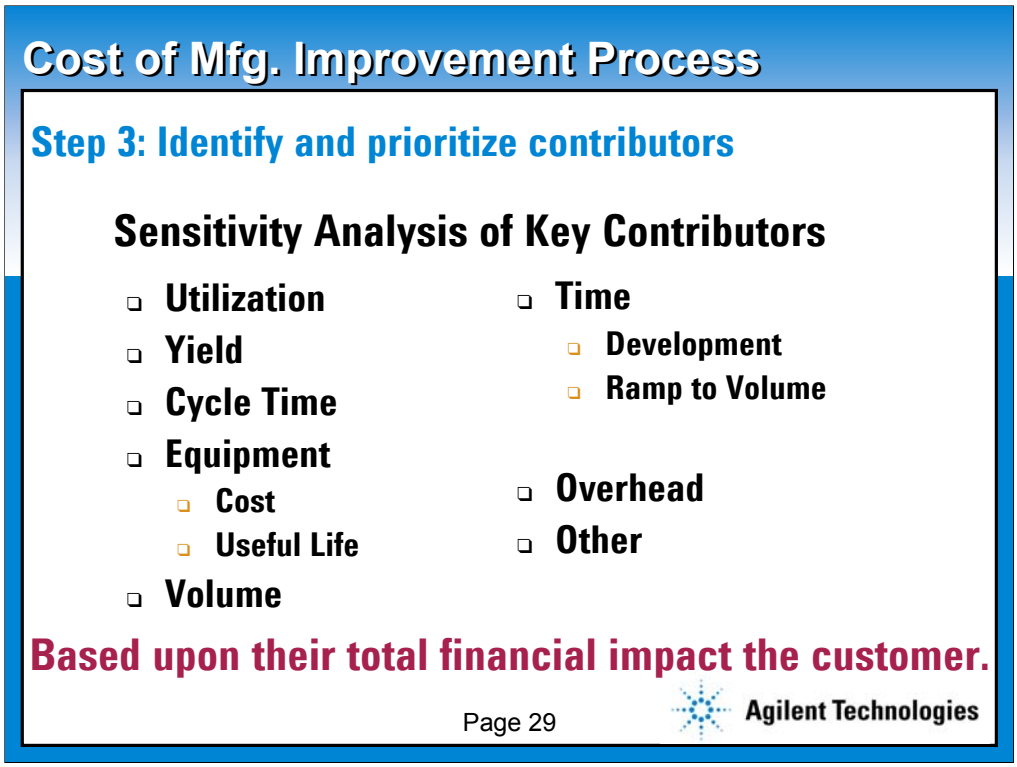

Using the sensitivity analysis capabilities of the tool we identify and prioritize the contributors so we can apply the resources to the most appropriate issue. Some of the key contributors include those that we have already discussed but could also include others.

It is important to know that the list of prioritized contributors is based on the financial impact to the customers. In other words, the highest costing contributors go to the top of the list.

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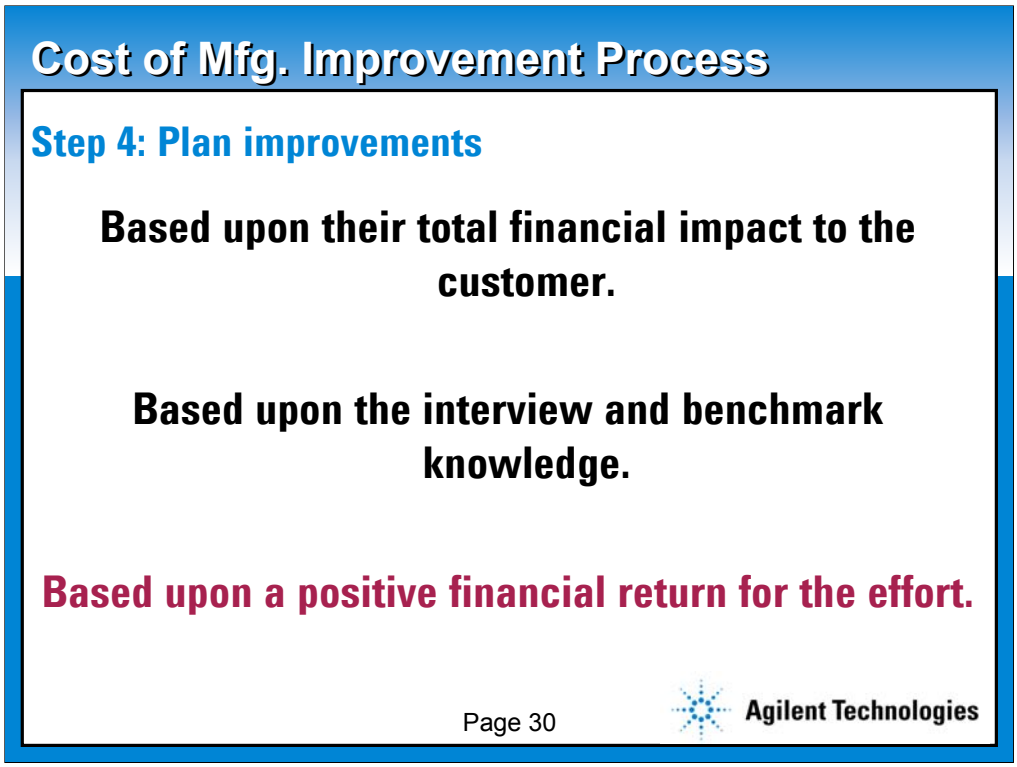

Once the prioritized list is developed we need to apply a bit of sanity to it. We ask ourselves several questions including:

•Is the list reasonable?

•What is the estimate of the solution compared to the return?

•Are there solutions that already exist that can be applied to get an immediate return for little or no effort?

Once this is done we continue the planning phase and ensure that the contributors that are decided to be worked on provide the greatest positive financial return for the invested effort.

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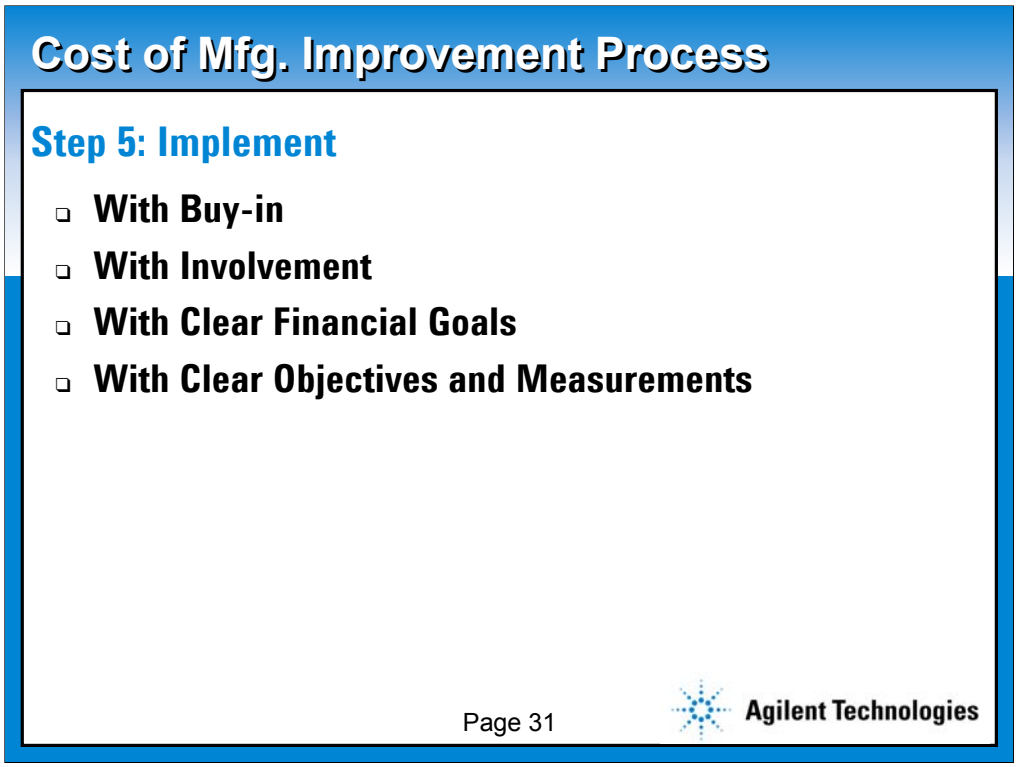
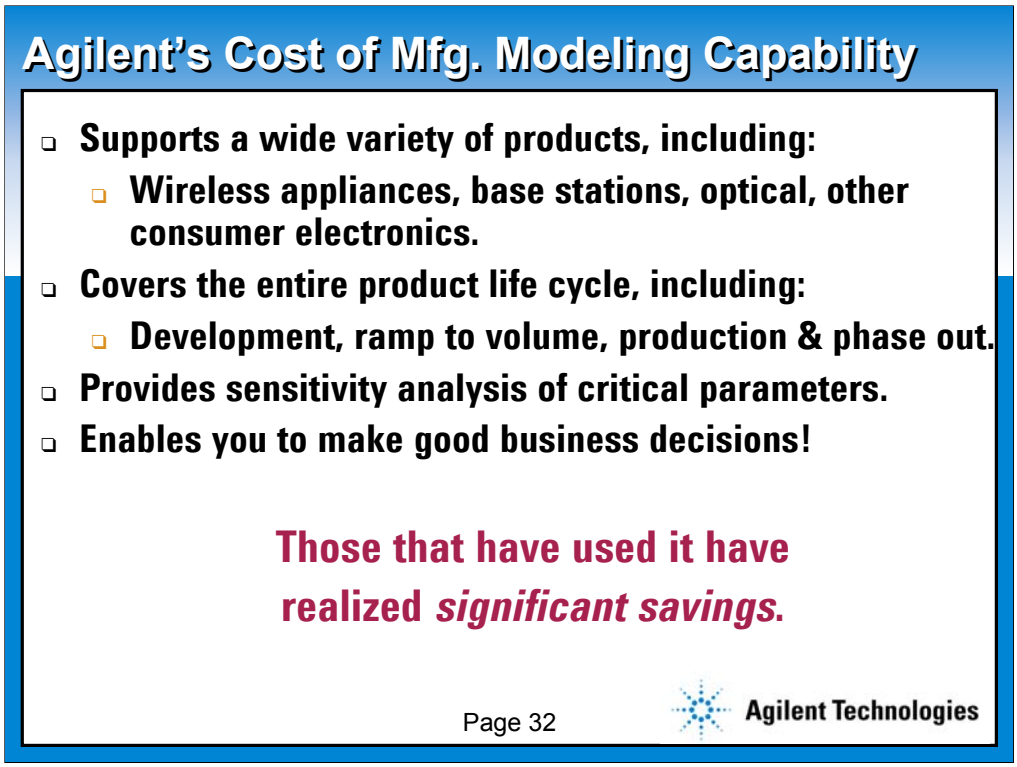


The final step of the analysis is really the first step in the implementation of the improvements. To be successful it will require buy-in and involvement by the interested and affected parties. And it will require clear financial goals and objectives that are measured for their success.

Slide 32 please.



Agilent's cost of manufacturing modeling capability supports a wide range of products.

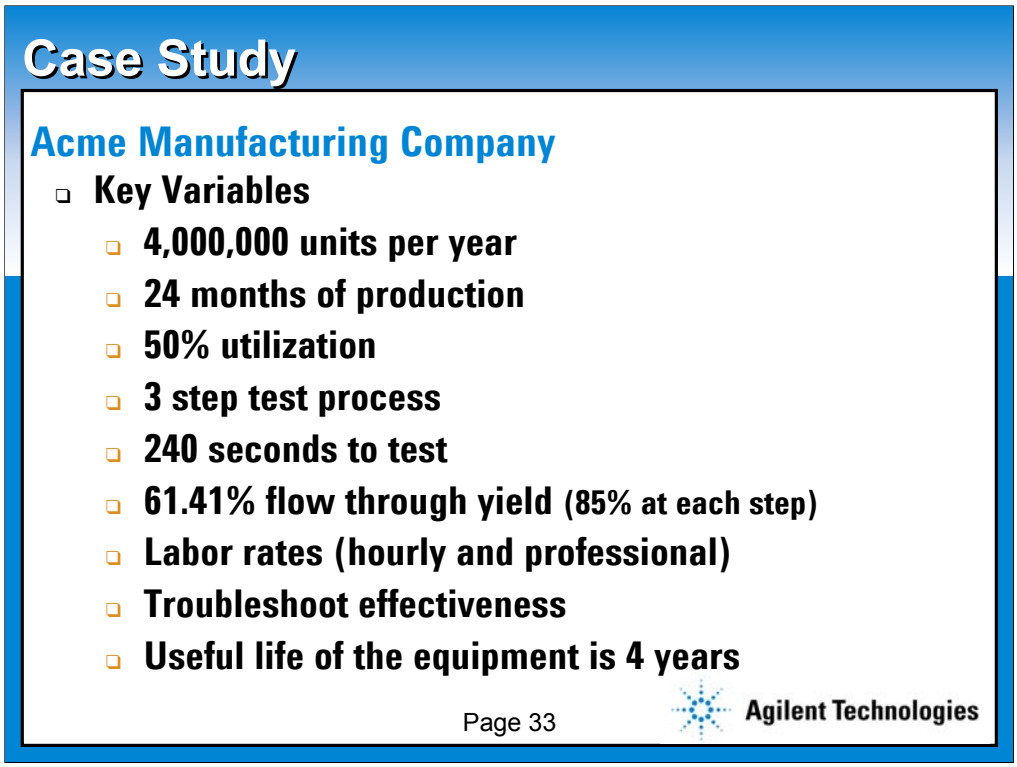
It covers the entire product life cycle so that all elements of cost are identified.

It allows a sensitivity analysis of critical parameters

But most importantly it allows you to make good business decisions around the improvement of your technology.

As proof of this methodology, customers we have worked with have realized significant savings. One customer will reduce their cost of test by approximately 20% or $2M by implementing the solutions jointly developed with Agilent. Another customer has the potential to reduce their cost of test by 32% by improving their top two contributors with previously developed solutions by Agilent.

Slide 33 please.



I'd now like to discuss a case study. It is for a fictitious manufacture of mobile phones yet uses relatively accurate industry average numbers.

Some of the key variables for this product are:

•The volume is for 4M units per year and production will run for 24 months

•The manufacturing process will be run such that the utilization is 50%.

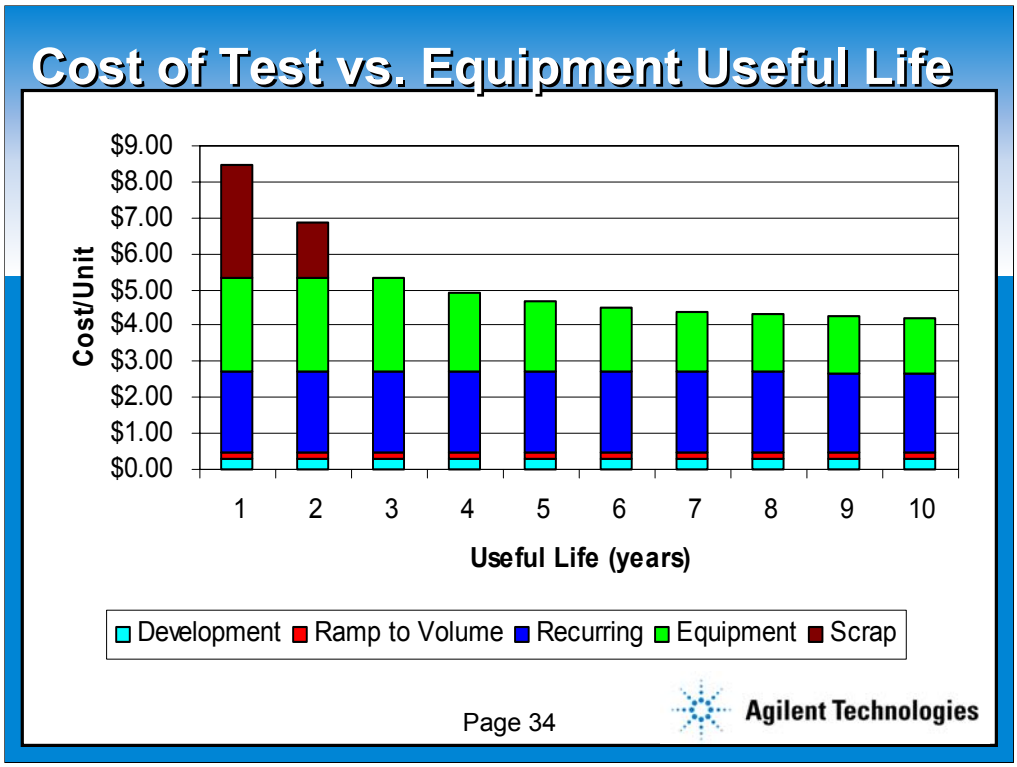
•The manufacturing process will deploy a 3 step test process with a combined test time of 240 seconds and a first pass flow through yield of 61.4%

•We will use typical labor rates for Asia

•And we will take into account the effectiveness the troubleshooters have in performing their jobs.

•There are many other variables included in the model and are too numerous to list, but all are included.

Slide 34 please.



So the model is loaded and we are now looking at the results of the sensitivity analysis. This first graph highlights the cost of test versus the useful life of the equipment.

The graph has 5 elements: Development, Ramp to volume, recurring, equipment and scrap

The two elements that affect the cost per unit the most by changing the useful life of the test equipment are scrap and the equipment cost itself.

All five elements are actually affected, but the change in the others is so small it can't be seen on this graph.

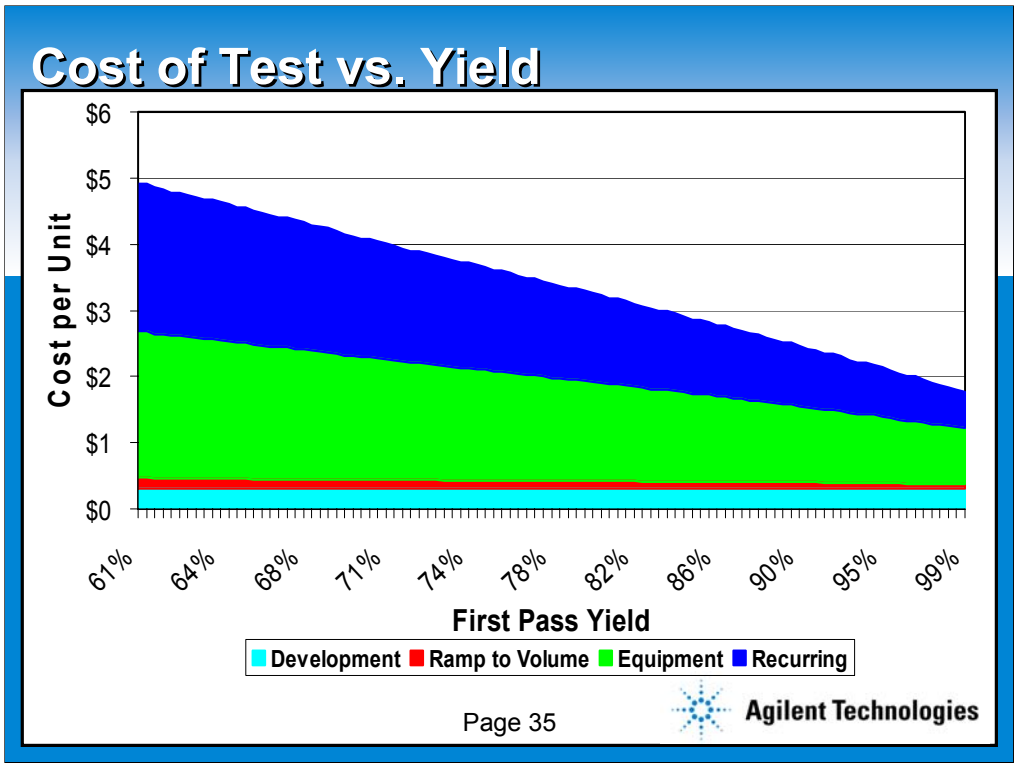
So how do read this graph?

It is important to note that the graph **DOES NOT** show the cost per unit for each year. What you need to do is select the number of useful life years your equipment has, for our case study it is 4 years. What this graph is telling us is that based on all of the variables we have loaded into the model every unit produced will cost $4.92. **NOT** $8.5 the first year, $7 the second year, $5.25 the third year, and $4.92 the fourth year. When the variables change due to improvements or when a new product comes on line the cost per unit will change and the model needs to be updated.

The takeaway from this slide is that it is important that the equipment be able to run at least 4 years, but 6 would be better. After 4 years the cost per unit becomes relatively flat and purchasing new equipment that is destined to be run at least 4 years has little impact on the cost per unit. I say this because the model takes into account the cost of capital or in other words the interest one would have to pay to borrow money to be able to purchase the equipment.

One of the huge benefits with using Agilent test equipment is that we strive to develop test equipment that can be operated for more than 4 years by having the right functionality in the product when it is released or by being able to upgrade the equipment when enhancements are introduced in the future.

Slide 35 please.



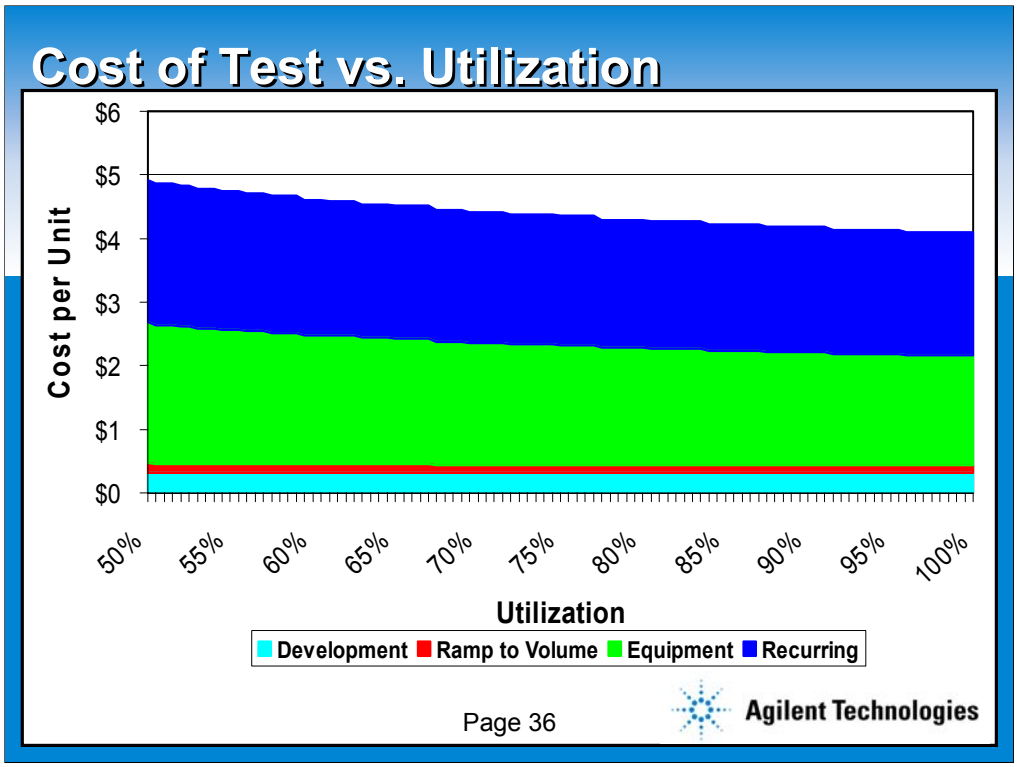
Okay we made it through the most difficult graph. This graph highlights the impact yield has on the cost of test. This graph is a stacked area graph. Meaning the incremental change in the different elements is added to the previous elements until the top of the entire colored area represents the cost of test per unit produced.

The model was loaded such that the first pass flow through yield was 61.4%. If we improve the flow through yield by just 1% the savings is around 8 cents per unit. This may not seem like a lot but if the improvement is done at the start of production then this equates to a total savings of $640,000.

Can you imagine a 10% improvement in the flow through yield. This would equate to $6.4M in savings over the life of the product.

This is why Agilent offers a yield optimization service to help you achieve these improvements and reap the rewards associated with the improvements. The earlier you involve Agilent in the product life cycle the greater chance these savings will become reality.

Slide 36 please.



This slide highlights the impact utilization has on the cost of test.

The model was loaded with a utilization of 50%. Based on a 1% improvement in the utilization this company would save 2 cents per unit. If the improvement is done at the beginning of the production phase this equates to $160,000 over the life of the product.

Again, imagine if the utilization is improved by 10%: this could equate to a 20 cent saving per unit or $1.6M if the improvement is done at the beginning of the production phase.

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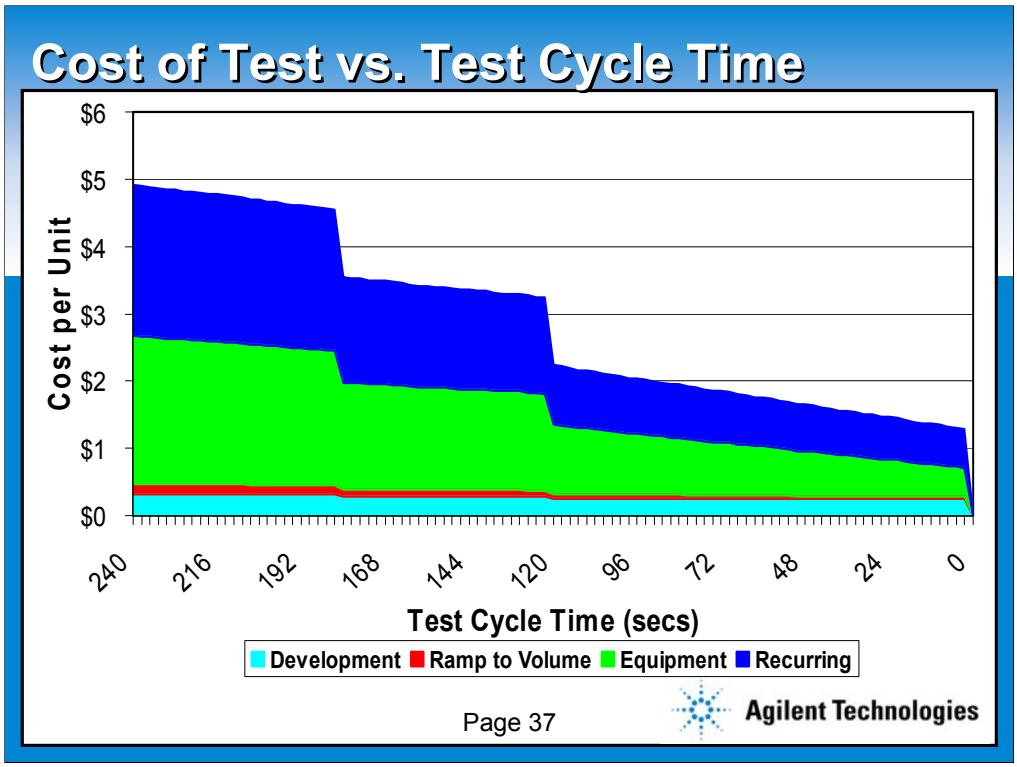


This slide highlights the impact test time has on the cost of test.

The model was loaded with a total test time of 240 seconds. Based on a 1 second improvement in the test time this company would save an average of 2 cents per unit. If the improvement is done at the beginning of the production phase this equates to $160,000 over the life of the product.

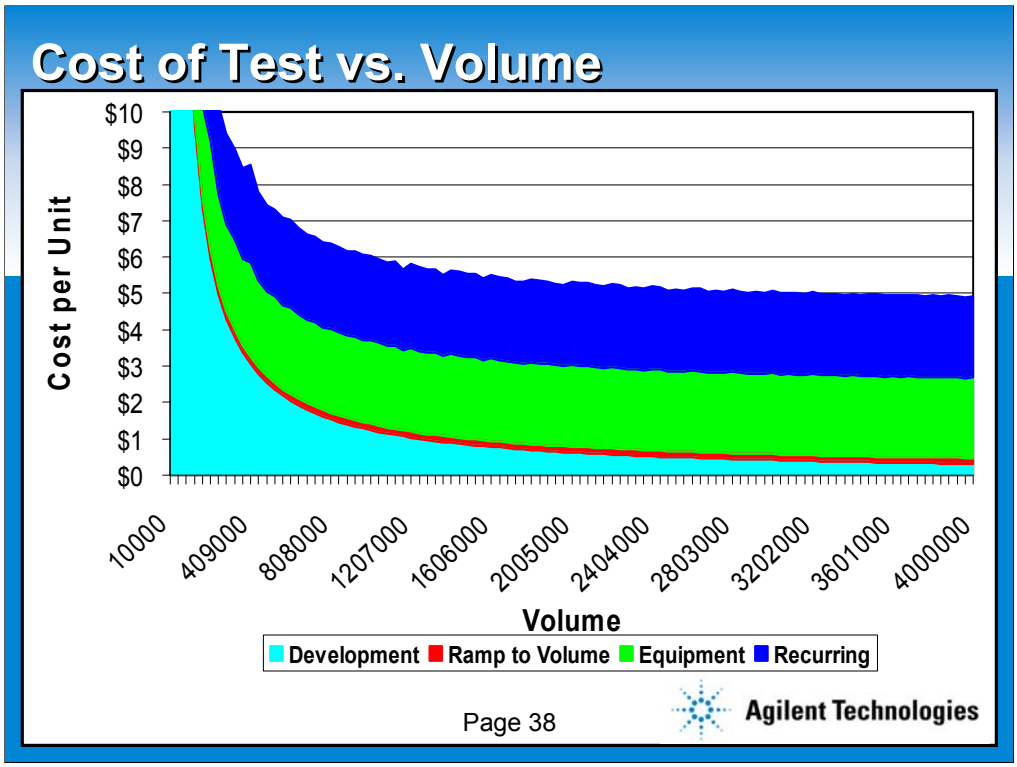
Again, imagine if the product is introduced with 20 seconds less in the test time: this would equate to a 40 cent saving per unit or $3.2M over the life of the product.

You will notice from the graph that there are 3 large step functions. This is due to fact that sufficient time has been taken out of the testing and, if possible, it is appropriate to eliminate one of the test points and move the remaining tests from the eliminated test points to the remaining test point or points. If it is not possible then the savings may not be as great.

The takeaway from this graph is that seconds do matter when you factor them in over the life of the product. A more expensive instrument that can save you just a few seconds of test time can easily be the best solution on a per unit basis.

Agilent has worked with many of its customers making improvements in this area. Several of our success stories range from tens of seconds to upwards of 2 minutes of test time eliminated from our customers test plans.

Slide 38 Please

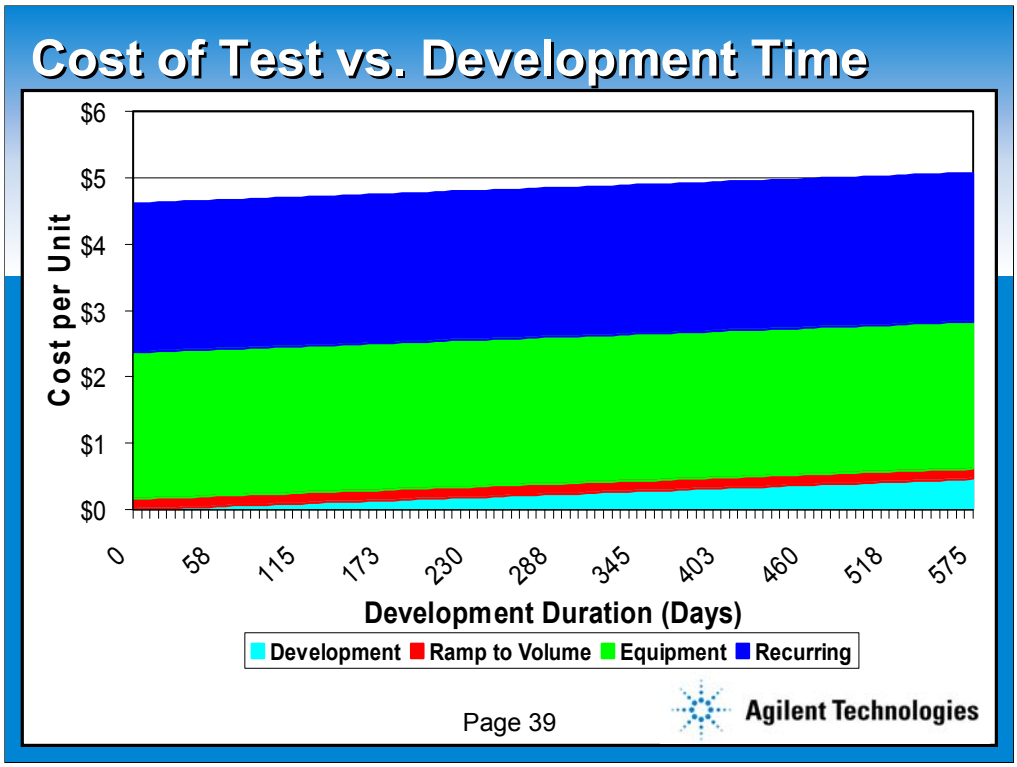


As I had mentioned before, volume is of major importance when trying to achieve the best cost per unit. This is because the development cost is volume independent and needs to be amortized over as many units as possible. What do I mean by this? Once the test methodology has been established, the development effort will take as much time as required independent of volume. If the volume is low then the cost of the development is only amortized over the smaller volume. If the volume is great, then the development cost can be amortized over a greater volume and contributes a smaller amount to the per unit cost.

It is important that customers that have low volume products be aware of this and really control their development costs. Standard off-the-shelf products that are quickly configured and integrated into the manufacturing process need to be used to keep the development costs down. This methodology is actually useful for customers that have high volume products, but the per unit savings will be less even though the total dollars saved will be the similar.

It is also important to know that once the development costs are amortized over sufficient units then the volume dependent elements like equipment cost and recurring cost start to dominate the cost, as they should.

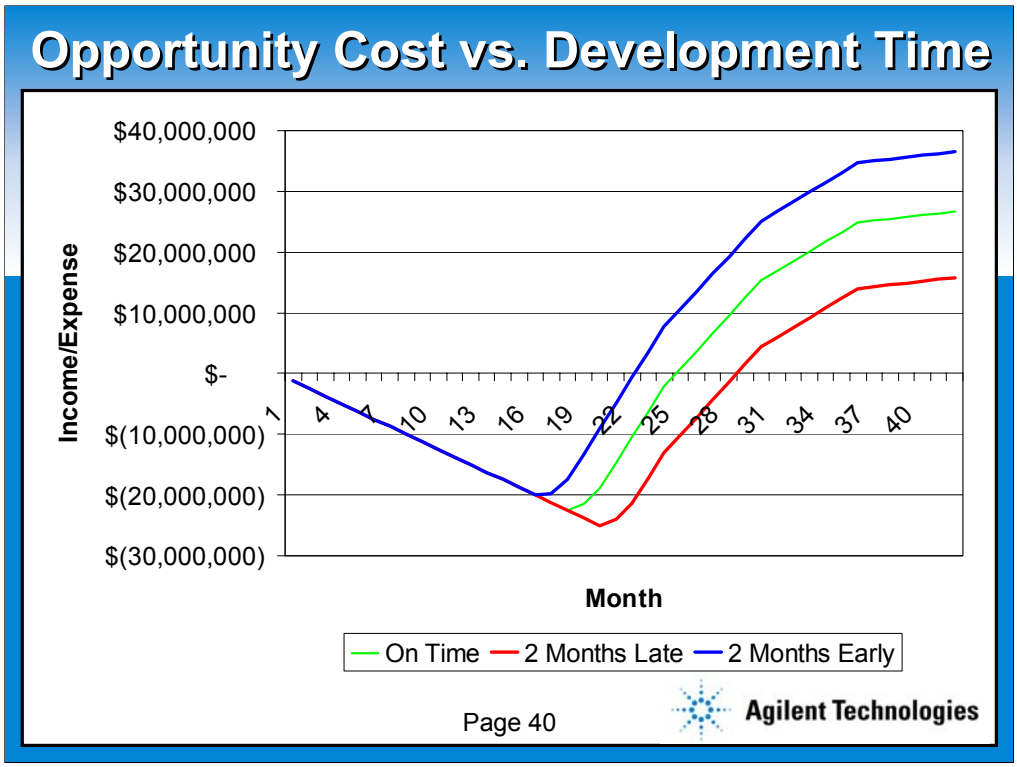
Slide 39 please.



I just briefly want to touch on the impact the time it takes to develop a test process has on the overall cost per unit. As you can see from the graph, unless the development time is changed drastically, like by a 200 days, development time has little impact on the per unit cost.

Where development time plays a bigger role is in the opportunity costs that are wasted or recovered when test is in the critical path of getting the product to market.

Slide 40 please.

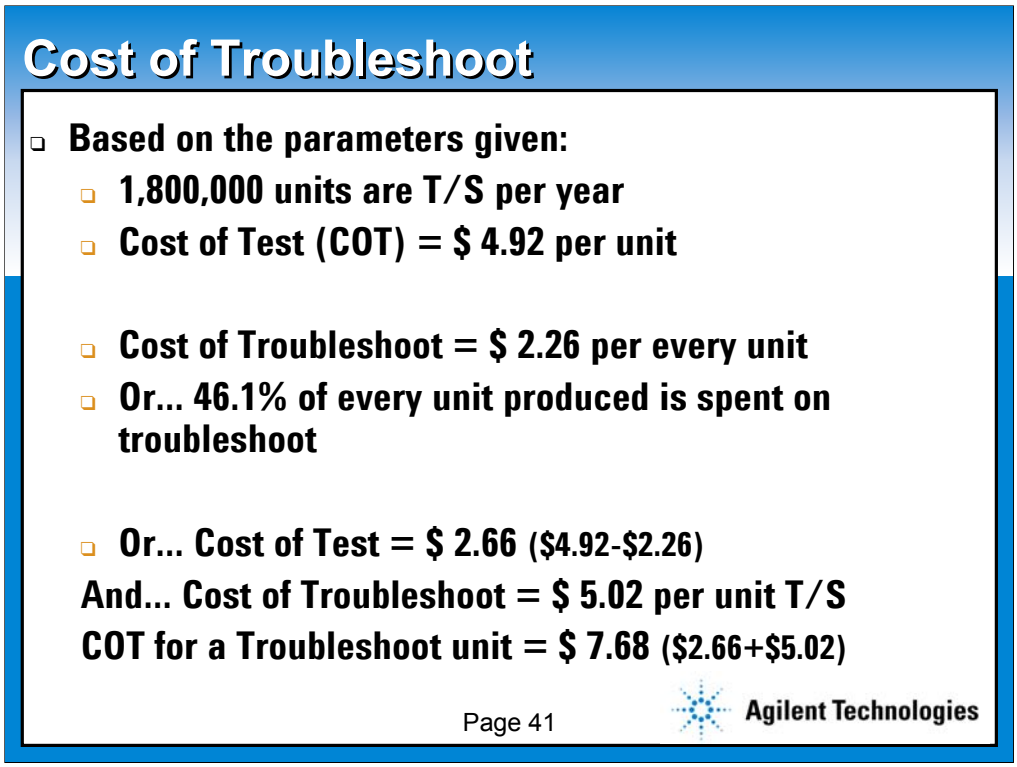


What this graph shows is the total cash outlay and income this company can achieve. By bringing their product to market on time they are able to achieve a profit of approximately $28M over the life of the product.

If they are two months late with their product they can only achieve approximately $17M in profit over the life of the product and the amount of money spent in development is much greater.

If this company can introduce their product 2 months early then their profit can grow to $38M and the amount of money spent in development is significantly less. Not to mention the fact that the development engineers can then get to work on the next product sooner and subsequently be early with that product also.

Slide 41 please.



As I had mentioned before, many people to do not pay much attention to the impact troubleshoot has on the overall cost of test. Based on the yield numbers and volume of our case study, 1.8M units will need to be troubleshoot. And based on all of the variables input into the model the overall cost of test is $4.92.

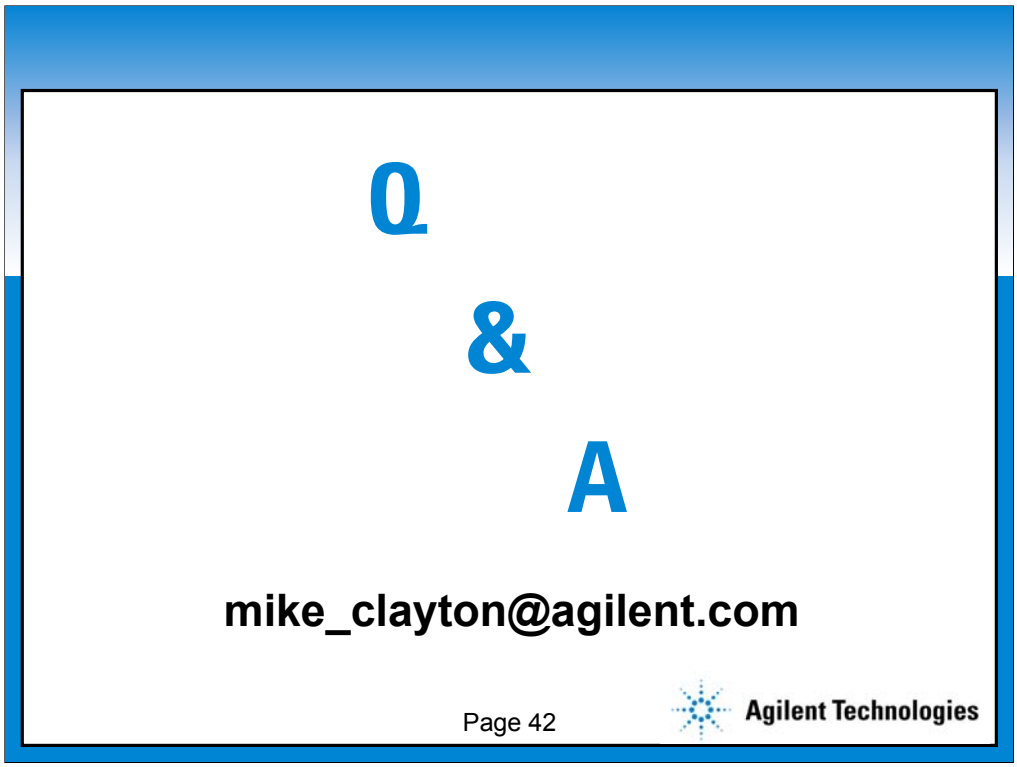
But, using the model and factoring out the costs associated with troubleshoot it indicates that $2.26 of every unit, even those that don't need to be troubleshoot, is allocated to the troubleshoot process. In percentage terms this means greater than 46% of the cost of test stems from troubleshoot.

To really distinguish between the cost of test and the impact troubleshoot has on it we need to further breakdown these elements. Subtracting the cost of troubleshoot from the Cost of test reveals that the cost of test w/o troubleshoot is $2.66. For the 1.8M units that do need to be troubleshoot, they would incur an additional $5.02 to be troubleshoot and their total cost of test and troubleshoot would be $7.68.

A pretty big number that few people really consider.

For this reason Agilent has developed a diagnostic tool called Fault Detective that allows failed units to be troubleshoot much more quickly and accurately at a significantly reduced cost. The tool allows a large percentage of the failed units to bypass the high costing troubleshoot process and proceed directly to repair and re-test. Results of this tool have indicated that are customers save an enormous amount of money by using this tool. This is probably the best tool available to make the greatest impact on improving our customers cost of troubleshoot and significantly impact the overall cost of test.

Slide 42 please.



Well, that's the end of the presentation. I hope I have imparted information to you that allows you to consider the impact your decisions on technology have on the financials of your company..

I want to thank you for attending and if you have any questions at this time I would be happy to answer them. If you have any questions in the future feel free to contact me at mike_clayton@agilent.com.

Q&A