Georgia State University New Phone Fulfillment Six Sigma Project

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Last Saved: 4/23/2007 3:16:00 PM Microsoft Word Document Revision # 28

Project Overview

The problem statement for this project is as follows:

New phone orders to the telecom group are falling outside the process window of completing routine requests within three business days. This causes a delay in the customer receiving the services needed and reduces the customer's satisfaction with IS&T.

In looking at several options for a Black Belt Project, this process stood out due to several changes in the environment over the next several months. Two main changes being introduced include a new help desk IT application and a new telecom system. Both of these changes will allow Information Systems and Technology (IS&T) to better control the interaction with the customer and cut down on the time it takes to complete processes from order to install.

In discussing the process of new phone order fulfillment with management, it was decided that this was a worthwhile goal to look at this process as part of Six Sigma certification. It would also help for IS&T to understand this process so that when the system is implemented, standard phone requests can be brought in line with other requests offered by IS&T.

In looking at this project, there was a clear line of scope drawn. This scope included new line orders where voice cabling was already in place. While new orders requiring cabling will follow the same process, there will be an additional step at the beginning of the process to have the cable installed. This can often take extra time depending on the cabling order and the schedule of the cabling vendor, so it is excluded from the process being evaluated. Many times new cable is needed as part of new construction or repurposing of a space. This is a special cause and out of the norm for the standard phone request.

Define Phase

What is the Big Y?

The big Y in this case is the ability to install a telephone for a Georgia State University (Georgia State) user within three business days. Currently GSU uses a system called Centrix that is supported by the Georgia Technology Authority (GTA) and BellSouth (AT&T). When an order for a new telephone is placed, the order passes through three different fulfillment groups and four or more orders are entered in different systems that do not communicate with one another.

For the customer, this process often appears to be broken. This is mainly due to the number of people involved with the order and the lack of communication Georgia State receives from GTA or AT&T. At times this communication is so bad that the only way to tell if an order is completed in a reasonable time would be to call the person making the request and ask them if it had been completed.

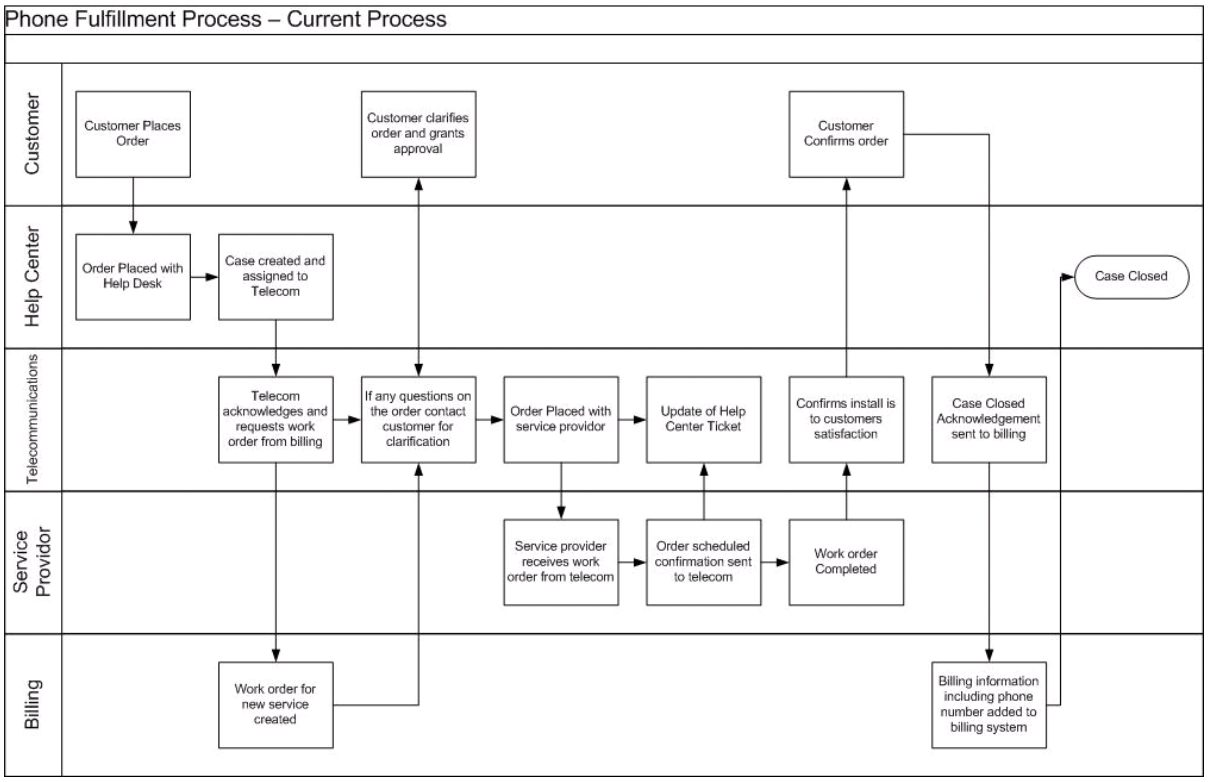


Figure 1 - Current Fulfillment Process

As you can see from Figure 1 above, the current process has many steps that are required in ordering new phone service. During the Define phase, it was apparent that no one person could explain the full process from beginning to end. Several interviews were conducted in order to piece together the process. Once this process was identified, service points could be established in which to measure the process.

The chart above does not show that the service provider is actually two different companies that are required to complete the service order. Georgia State places the order with GTA that processes the order and passes it along to AT&T to provide the service. Confirmation of the order and scheduling then has to pass back from AT&T through GTA to Georgia State who then notifies the customer. While Georgia State only deals with GTA, the complexity of communication is a continued issue for the process. In the future, one of the major changes taking place that will help clear up this issue is the introduction of a new phone system managed by Georgia State. At the point of installation, IS&T will fulfill the full process therefore exercising better control over the process.

One of the other issues that was uncovered during the define phase was the issue with our phone numbers and support that is received from GTA. The telephone numbers and support given to Georgia State are shared with other state agencies including the legislature and governor's office at and around the State Capitol. At the beginning of a new year, when the new legislature is seated, resources are diverted from others in the area to take care of setting up for the legislative session. This often equates to a delayed processing of requests in January and February. With the current process and politics, this

is out of the control of the process. Therefore, changing the process to where communications support is local to Georgia State will help to remove this problem.

In defining the process, there was also a question of scope. While so many processes will be changing, the project needed to focus on one area to begin the improvements. The project looked at the new phone fulfillment process for two reasons:

1. The current process was taking up to four weeks for fulfillment while other standard requests being performed by IS&T were being handled within three business days. The goal of the process was to bring it in line with the other standard request offerings.

2. The introduction of a new help desk application that would allow for user self service. This new application would allow for Georgia State Faculty and Staff to request new phone service over the web. The introduction of this new technology would make it easier to gather an order and to make sure that all of the proper information was collected. This improvement would help improve the process for the customer and would require a new process to be developed for telecommunications.

Scope was also defined as “new service for space where an available voice cable currently existed”. If a cable was not at the location where the phone would need to go, this would require an additional work order to a cabling contractor to run and test the cable before the phone could be ordered. Since this required another vendor and process to complete, this was excluded from the scope of this project. Once the cable was installed, the process could pick up from this point and continue using the methods developed.

In defining the project, the team also looked at the steps that would be critical to satisfying the customer needs. This information was collected as part of a customer survey sent out by IS&T asking for those qualities that are expected in the fulfillment of any work order and not just telecommunication orders.

The team took that information and talked to some customers, internal and external, to determine what would be a quality experience in receiving a new phone. Based on the responses received, a Critical to Quality Tree was drafted as shown in Figure 2.

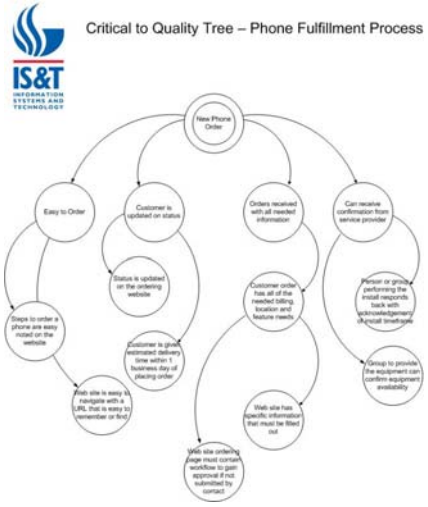


Figure 2 - Critical to Quality Tree

Measure

In looking for points to measure, the project turned to the Remedy Help Desk System (Remedy) in use by the technicians. All new requests for phone service are entered into this system and categorized by Category, Type and Item. In looking at the cases, a report was run asking for the Category of **Telecommunications** and the type of **Telephone**. For each of the **Items** identified, they were grouped together for reporting purposes.

In evaluating the process, the project team looked at all closed cases from January 1st to December 1st of 2006. This was the latest information available for reporting. For each of the cases identified the date that the case was opened and the date the case was closed were queried. From these two dates the duration of the ticket could be calculated. Since the project was focused on shorting the duration, the current duration was used as a starting point.

Analyze

Once all of the data was pulled from Remedy, the team went about analyzing the time for the current process. In looking at the total for all Telecommunication Work orders, there were several **Item** categories that needed review. This list of work orders included:

- New Analog Phone
- New Digital Phone
- New Phone Line
- Disconnection of Service
- Feature Programming
- Long Distance Access
- Telephone Relocation

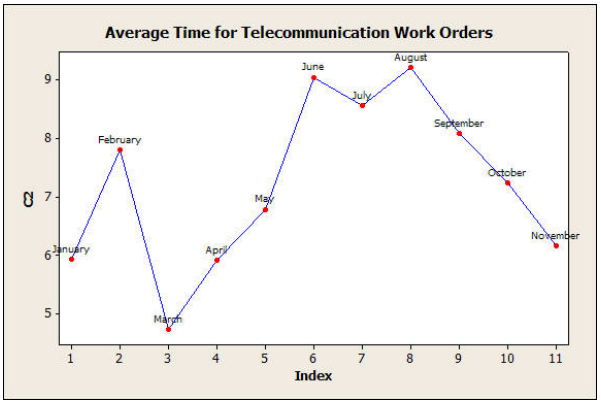


Figure 3 - Average Time for Telecommunication Work Orders

While not all of these work orders are for new phone service, each of these items could require an external vendor in order to complete the request for the customer. In graphing the average to complete this full group of orders, there was a wide swing in the days to complete as you can see in Figure 3 above. It ranged from a low of 3 days in March to a high of almost 10 days in August.

The first analysis that was completed was to run an I-MR chart of the averages for all of the numbers noted above. The chart can be seen in Figure 4 to the right. After running this control chart, it was determined that for the work orders completed, the department is in control with an upper control limit of 10.784 and a lower control limit of 3.655. The lower control limit is currently above the specification desired and the future process must be designed to lower the overall time to complete a work order.

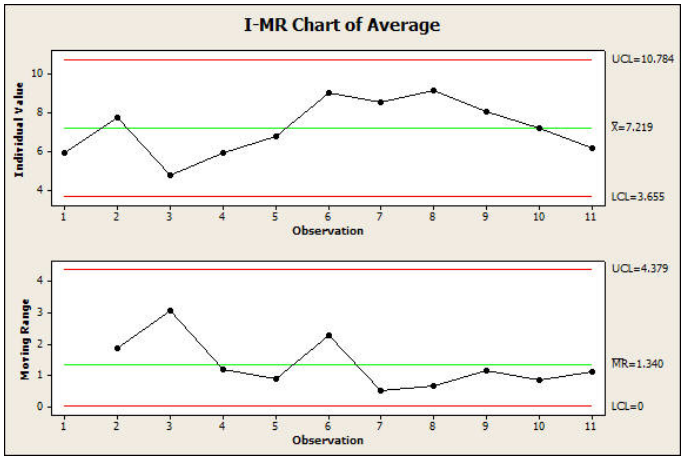


Figure 4 - I-MR Chart of Averages for Telecommunication Work

In further refining the numbers, the next step in the process was to break down each of the **item** categories above. While not all of these categories have to do with installation of a new telephone, with a small amount of extra effort it was decided to generate a control chart for each category. This would help to determine if there was one category that was pushing up the average for the entire department and it would also help to determine if the department was in control in all areas.

While the purpose of the project was to look at the telecommunications department, and specifically the connection of new phone service, the project took the time to run control charts on each of the specific **item** categories to determine if there was an identifiable problem that may need further investigation. These extra measures were charted and evaluated to look for root causes for other issues that may contribute to the process being evaluated.

The first group of measures that were completed was with the **issues** of *New Analog Phone*. Due to the amount of cases that were available, the team ran an Xbar-S chart on the data. The results, which can be noted on slide 12 of Appendix A, showed that the process was in control. While the numbers are very high compared to our goal of a three business day turn around, the point we wanted to find in the numbers was control.

The second group of measures that we undertook was with the **issue** of *New Digital Phone*. Again the results, noted on slide 13 of Appendix A, shows that the process is in control.

The third group of numbers that we evaluated was the **issue** of *New Phone Line*. At first glance of this chart, we realized that the process was out of control and needed further investigation. In the charts we noted that any points below the lower control limits are actually good and the desired state. The goal is to drive down all of the cases so that they can be completed in the shortest amount of time possible. These lower cases were noted so that in the future they could be examined for best practices. The real investigation and analysis was the search for why there were cases that were popping out above the upper control limits.

The first step was to rerun the control chart allowing for more points to be used in analysis. The goal would be that with more points, the problem areas would be easier to spot as well as determine how big of a problem there was with the process. After running a chart using every 20th data point, there were two points that moved above the UCL. At data point five, see slide 17 in Appendix A, there was a case that took 176 days to complete driving the process out of control. After further investigation it was determined that this was a test ticket placed in the system by the administrator, but never closed. At point 26 there was a ticket that took 66 days to complete. Investigation showed that this spike was due to special cause where the user called in and changed the delivery date, therefore pushing it out. The next step was to remove these two points from the dataset and rerun the control chart.

At this point there were two new points that rose above the upper control limit on the chart. The first point was at data point 16, see Appendix A slide 18. This point contained a work order that took 65 days to complete in June 2006. Point 27 also has a work order that took 58 days to complete in September. Both of these points were due to order changes by the customer and not an issue with the telecommunications office. These points were also removed from the dataset and a new control chart created.

This new control chart, Appendix A slide 19, again showed two points above the UCL. At data point 20 there was a work order taking 47 days to complete. After further investigation, it was noted that this order was for multiple new lines in a newly renovated space. The delay of the order was due to the construction schedule and not part of the phone ordering process. The second data point showed a case that took 31 days to complete. This was also delayed due to needed construction and cabling requirements. These two points were removed and the analyses again run on the dataset.

This fourth run showed only one data point popping above the upper control limit. Further investigation of this data point showed that there was a case in August taking 44 days to complete, Appendix A slide 20. The delay on this point was due to the user changing the order before cancelling it. Removing this data point from the set, a new control chart was run on the remaining data.

At this point all points are below the upper control limit of the process. There was one point that showed below the lower control limit, since this is the desirable state, this will be evaluated to see if the procedure can be duplicated to show future improvements.

Moving to the next **item**, the project looked at cases related to *disconnection of service*. In running the initial control chart, there was one point that jumped above the upper control limit. The two points that need to be investigated included two cases taking 48 and 40 days. Both of these cases are due to delays with the vendor. These two points were removed and another rendition of the Control Chart was developed.

This time there showed one data point that rose above the upper control limit. This point showed a case in July that took 23 days to complete. This too was due to a delay with the vendor. Once this data point was removed, the control chart was refreshed and now the process is in control.

The next **Item**, which was reviewed, was *feature programming*. While this process does show out of control, the point out of control is actually below the lower control limit. The goal is to complete the work orders as quickly as possible so any points below the lower control limit is desirable and should be investigated to determine how all calls can be completed in the shortest amount of time. In looking at this case the request was something that could be taken care of by the telecommunications agent and did not require involving external vendors.

Long Distance Access was the next **Item** to be reviewed. Due to the low number of observations for Long Distance tickets, an I-MR chart was used. Based on the findings of the control chart, one outlier took six days to complete in August. This was due to a process issue with GTA, the vendor. Once that point was removed from the dataset, the I-MR chart was recalculated. At this point there was two points that took two days to complete, since all other work orders were completed in one day; these two points were above the Upper Control limit. Since the specification of the customer is to complete within 3 business days, then all of these cases are within the control limits of the customer. No further investigation of the issue was necessary.

The final group of **items** that was investigated as part of the Analysis was for *Telephone Relocation*. Upon the first run of the Control Chart, there was one point that was above the Upper Control Limit. This case took 61 days to complete due to rescheduling by the customer. Once this point was removed from the dataset, then the control chart was rerun. Once this point was removed and the chart regenerated, then the process showed in control.

There were several findings that were uncovered during the analysis phase of the project. One of the major findings was the excessive number of categories used to define new phone service. In looking at the tickets assigned to each category, it appeared that the categorization often depended on who originated the request. One of the recommendations being made as part of this process is to reduce the number of categories for new telephone service to one. As part of the request, fields will be included to capture attributes for the request including the type service and model of phone that the customer is requesting. This will eliminate the need for categories such as New Analog Phone and New Digital Phone.

One other observation as part of the analysis is that all of the excessive cases are due to either a customer or service provider issue. Telecommunications taking over the support of the phone system will eliminate the issues of vendor that are currently beyond the control of this process. There will always be issues where orders and customer requirements change due to priorities or customer processes. The process needs to be able to note these points where there is a customer delay and this time not count against the department or the process. One solution would be to use a pending field and have the time that a case is in pending is not counted against the department.

The analysis has shown that there are two phases in which changes should be implemented in order to gain the benefits as early as possible. The first phase is an interim that can be implemented until the new phone system is installed and managed by Georgia State. These changes can be easily done through the new Help Desk case tracking system that has recently been implemented. The quickest win is the

ability of the customer to enter in a ticket through a web site with all of the needed information. This will eliminate the need for the Help Center to take the call saving these resources for other issues. This will also make sure that the ticket is categorized correctly as it will automatically categorize the request taken in by the web. Also the web form will allow the customer to enter in the ticket and put in all needed information without it having to pass through a gatekeeper such as the helpdesk. This will speed the time it takes to get the ticket to the telecommunications group so that they can begin the fulfillment process. Changes to the process can be seen in Figure 5 below.

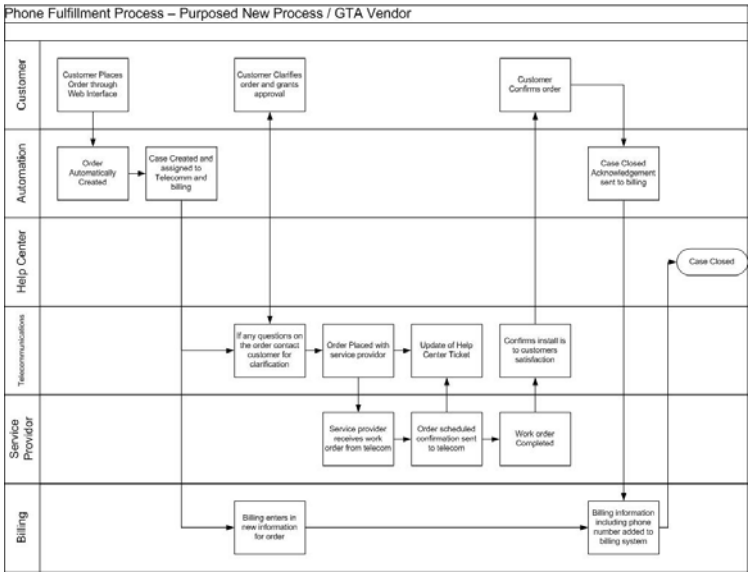


Figure 5 - Interim Phone Process

The second process improvement that can be activated now, and will carry over to the final solution, is to complete notifications in parallel. In the current process, the work order must go to the telecommunications group, that sends an order to billing to create a service request, and then wait for the service request number to be sent back to start the process, see figure 1 page 3. In the new system we will be able to have parallel tasking so that the work order can be sent to the billing specialist and the telecommunications group simultaneously. While the billing group completes the service request in the billing system, the telecommunications representative can begin verifying the order and any preliminary provisioning. This will greatly reduce the amount of time between ordering and beginning work to complete the order.

The final change in this interim step would be to have automation confirm that the ticket has been resolved to the customer's satisfaction. Under the old system, the telecommunication technician would have to contact the customer and make sure that the order was completed and could be closed. The new help desk software will instead send out an e-mail letting the customer know that the issue has been resolved. If the customer is not satisfied with the resolution then they will be able to click a link in their e-mail message to reopen the ticket. This will reduce the need for the telecommunications agent to follow up with the customer if there was a successful installation. If there was a problem with the installation, then the customer would be able to click a link indicating that the ticket was not completed. This would reopen the case and escalate the ticket to management to follow up with the customer.

The new phone process that will be capable of being implemented at the completion of the new phone system installation will include additional process improvements. This includes keeping and building on all of the changes implemented as part of the interim process. The main change is the reduction of having to work with an external vendor as shown in Figure 6. Bringing the full process in-house will allow

telecommunication to quickly access all of the needed information to communicate with the customer. The group will also control the ability to make several of the feature modifications on the fly. This will greatly reduce the lead time and allow the three business day goal easily reachable.

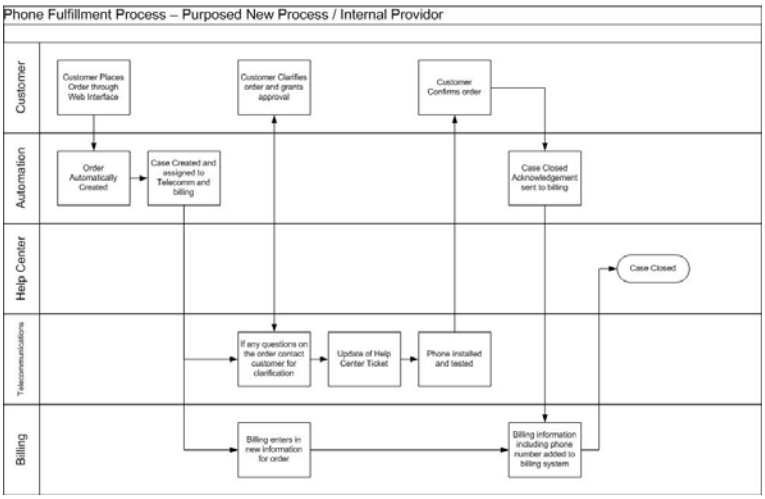


Figure 6 – New Phone Process

One other possible change that could reduce the cost for this process would be to have automation create the billing work order. The Help Center application has the ability to pass information to external systems. One way to increase the productivity would be to have the billing service order generated automatically based on variables passed to it. This would eliminate a human interaction in the process and save additional process costs.

In order to match the improvement to the bottom line, the proposed changes also had a cost justification model. The purpose of the model was designed to show how much time could be saved as the solutions were implemented as well as the cost benefit and possible customer cost reduction. The goal was to see if cost to the customer could be lowered and revenues go up for the department. All cost recovered for the system would go back to pay for the system and to reduce the need for network and phone cost from the university's general operating budget. The stated goal for the customer is that the system would be self sufficient while not increasing any costs to the university customer.

			Current Process			New Process		
Process Steps	**Person Performing Task**	**Rate**	**Current Process % of Time**	**Current Process Time**	**Current Process Amount**	**New Process % of Time**	**New Process Time**	**New Process Amount**
Help Desk Case (per Call)	Help Desk Agent	$28.00	100%	0.50	$14.00	40%	0.50	$5.60
Web Case	Web	$4.50	0%	1.00	$0.00	60%	1.00	$2.70
Verification of order	Voice Communication Admin	$22.00		0.50	$11.00		0.50	$11.00
Billing Work Order	Billing Specialist	$17.00		0.50	$8.50		0.50	$8.50
Placing Order with Vendor	Voice Communication Admin	$22.00		0.50	$11.00		0.50	$11.00
Waiting for Fulfillment (per Day)		$25.00		6.80	$170.00		5.00	$125.00
Order verification	Customer / Voice Communicaiton Admin	$22.00		0.50	$11.00		0.50	$11.00
Closeout survey	Web / Help Center	$4.50		1.00	$4.50		1.00	$4.50
Total					$230.00			$179.30

Figure 7 - Cost with Current and Interim Process

The first step was to break down the process to determine who would perform each step along the way. Using the current process the team identified all of the touch points. Then, working with Human Resources and the Help Center manager, a loaded hourly rate was determined for employees in the process. The next step was to time the process and to see how long it would take to complete each step. Figure 7 above shows the cost and times associated with the current process and the interim process.

In defining the cost for the process, current processes formed a basis for investigation. Currently the only way to order a phone would be to contact the Help Center and place an order with a Help Center Specialist. In the future the ability to place an order via the web would greatly reduce the cost. When reviewing Figure 6, you will notice that percent of process time for a web case in the current process is zero since that offering is unavailable. Under the new process the web case is at 60%. In discussions, there are still a number of people that will contact the Help Center and place an order. Based on other trends both at Georgia State and in the industry, a conservative figure was used to estimate the cost differential.

The other cost savings in the new, or interim process, would be the wait time for the customer. In building the financial model, a figure of $25.00 per day was added on behalf of the customer. Most orders are placed with some lead time before the service is actually needed, but there is still a customer commitment for waiting on the technician, verifying the order, etc. The number was also inserted in the table to show management what kind of impact could be estimated by lowering the days to complete an order. Lowering the days to complete from 6.8 (average from past ticket orders) to simply 5 days has a $45 per request impact on the bottom line.

The model, while trying to be as accurate as possible, is conservative. The interim process still has to rely on external vendors to complete much of the work. Improving the internal processes should be able to lower the goal from the current average of 6.8 days to 5 days. To move beyond this goal will be very difficult until the full process is in house.

				Future Process	
Process Steps	**Person Performing Task**	**Rate**	**Future Process % of Time**	**Future Process Time**	**Future Process Amount**
Help Desk Case (per Call)	Help Desk Agent	$28.00	20%	0.50	$ 2.80
Web Case	Web	$4.50	80%	1.00	$ 3.60
Verification of order	Voice Communication Admin	$22.00		0.50	$ 11.00
Billing Work Order	Billing Specialist	$17.00		-	$ -
Placing Order with Vendor	Voice Communication Admin	$22.00		-	$ -
Waiting for Fulfillment (per Day)		$25.00		3.00	$ 75.00
Order verification	Customer / Voice Communicaiton Admin	$22.00		0.25	$ 5.50
Closeout survey	Web / Help Center	$4.50		1.00	$ 4.50
Total					$ 102.40

Figure 8 – Costs with Future Process

Figure 8 above shows the purposed cost with the future changes. You can see above that through automation and using a automated system, there are two process steps that can be eliminated reducing the cost. The Billing Work Order step would have to wait until the final implementation due to the technical aspects of the phone system, billing system and Help Center system working in harmony. After review of the model, the purposed process improvements could net a savings of almost $130 in savings per new phone order. This would add up to considerable savings over the course of a year.

In looking at the numbers, analysis also led to looking at the cost charged by service providers currently installing phones for Georgia State. You can see the charges in Figure 8 below. Currently there is a work order generation fee from the university, a GTA work order fee and an AT&T fee charged to the customer. While the university remains with the leased system, these costs will not be reduced. Once the system is brought in house, then the cost from GTA and AT&T can be eliminated. In the presentation to management, a case was made that a 250% increase in the work order generation fee would still net a 52% savings to the customer. This would help to recover the cost for the system and installation while lowering the cost burden to the customer for installing a new phone line (see figure 9).

	Current Process	New Process	Future Process
Work order Generation	$ 22.00	$ 22.00	$ 55.00
GTA Workorder Fee	$ 32.50	$ 32.50	$ -
Bellsouth Fee	$ 60.00	$ 60.00	$ -
Total	$ 114.50	$ 114.50	$ 55.00

Figure 9 - Service Order Costs

The last step to the analysis phase was building a decision support system for the changes. Putting the labor and service request cost together allowed the project team to build a model that would determine a cost justification of the new system. The decision support system is built so that the user can fill out the information in the yellow boxes located at the top of the model. Once this information is put into the system, then the manager can determine an estimate of cost and time saved among the different models.

New Phone Ordering
Decision Support System

Number of Lines	1
Days to Install	3
Type of Order (1 = Help Center, 2 = Web)	2

	Current / New Time	Current / New Cost	Future Time	Future Cost
Order Reception		$ 14.00		$ 4.50
Verification of Order	0.50	$ 11.00	0.50	$ 11.00
Billing Work Order	0.50	$ 8.50	-	$ -
Work Order		$ 22.00		$ 55.00
GTA Work Order		$ 32.50		$ -
BellSouth Work Order		$ 60.00		$ -
Fulfillment Time		$ 75.00		$ 75.00
Order Verification	0.50	$ 11.00	0.25	$ 5.50
Closeout Survey (Help Center)	1.00	$ 4.50	1.00	$ 4.50
	2.50	$ 238.50	1.75	$ 155.50

Figure 10 - New Phone Fulfillment Decision Support System

The decision support system designed for this project is shown in figure 10 to the left. This model calls on the information from the previous spreadsheets shown earlier in this report. The model was designed to only calculate the price differential between the old system and the future system when Georgia State

will have their own telephone switch. This was by design since the interim step was designed for a period of less than six months and the goal would be that this model could be used for some future time. Also, both models use the same number of days to complete based on the information that is input by the user. This will give the user a very conservative estimate of the difference between the two systems. In the real world the newer number would be less, therefore making the numbers gap greater. The user could go in and manually adjust the numbers to show this, but the goal is more for an example to show management likely cost justification as we move to the new system.

Implement

At this point in the process we are early on in the implementation of the changes discovered and recommended as part of the discovery phase above. One of the changes that has been implemented is the new Help Desk software and the ability for the Help Center to gather better information on a new phone request. While the new application is available internally to the Help Center and technicians, the web pages for the general population are still under design and testing. This is slated to be on-line this summer and will most likely match up to the introduction of the new phone system.

The other change that has helped in the very short term is the limiting of the Category – Type – Item classification for a new phone. This has reduced the confusion of the Help Center and others that put in these requests. With the additional detail screen to make sure that the correct information is gathered, the orders have more accurate information meaning less follow up work by the telecommunications team.

Summary

From the analysis and work completed as part of this project, several improvements are being implemented to improve the process of ordering a new telephone on the Georgia State Campus. Moving forward this project will help to increase the efficiency of the telecommunications department not just for this type of request, but will bleed over into all requests performed by this department.

In learning the tools and vocabulary as part of this process, it will help as future improvements are evaluated and implemented at the university and through IS&T. Further process improvements using the Six Sigma methodology could be done by evaluating the top requests and performing a control chart and process mapping on each. Doing so could help all requests and issues reported so that customer service and perception is improved.

Appendix A – New Phone Process PowerPoint Presentation

New Phone Process

Georgia State Six Sigma Black Belt Project

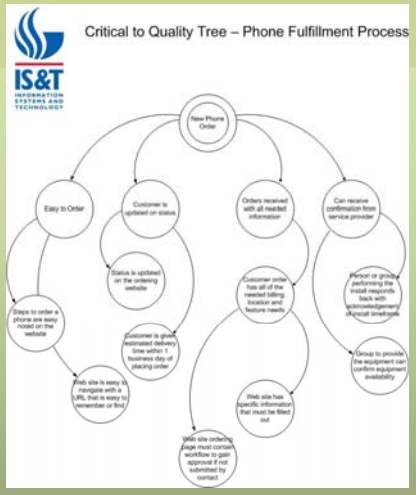
Problem Statement

New phone orders to the telecom group are falling outside the process window of completing routine requests within three business days. This causes a delay in the customer receiving the services needed and reduces the customer's satisfaction with IS&T.

Critical To Quality Tree

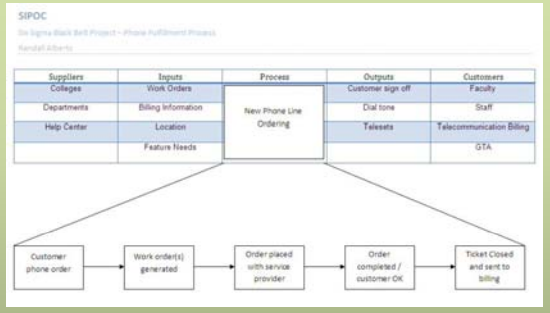
To start the process, I looked at the steps that would be critical to satisfying the customer needs. This information was collected as part of a customer survey sent out by IS&T asking for those qualities that are expected in the fulfillment of any work order and not just telecommunication orders.

I then took that information and talked to some customers, internal and external, to determine what would be a quality experience in receiving a new phone.



Process Mapping

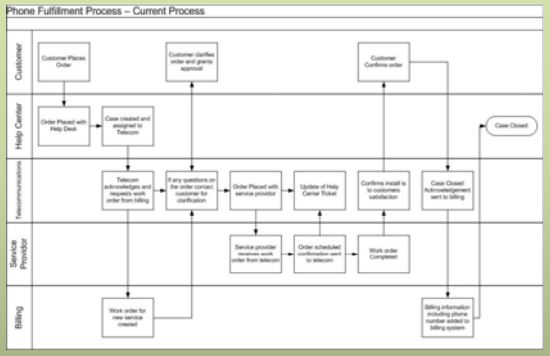
In looking at the process I worked on a SIPOC that outlined the process for ordering a new phone. This included a high level process map that would be used as a basis for the project.



Process Swim Lane

I also went and spoke with many of the people involved with the process of ordering a new phone. Based on several conservations, I developed a swim lane process map to show the process of work orders and interactions.

This was also eye opening to see all of the hand off points that did not have a direct handshake to make sure that the order was received and accurate as to what the customer actually wanted.



FMEA

In talking to the customers and the process participants, I started a FMEA of the process.

Current Situation

- Phone orders must be completed by BellSouth through GTA
- Estimated time to complete is 5 – 10 business days
- Phone resources are shared with all other Georgia Government departments

Current Process

- Three work orders are required by Georgia State for new tickets
  - IS&T
  - Pinnacle Billing
  - GTA
- None of the current systems communicate with each other – requiring manual input of each new ticket

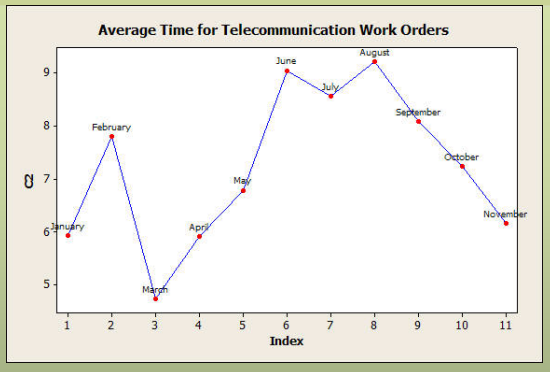
Time to Complete a Telecommunications Work Order

This chart shows the average time to complete a telecommunications work order in 2006.

This includes:

- New Analog Phone
- New Digital Phone
- New Phone Line
- Disconnection of Service
- Feature Programming
- Long Distance Access
- Telephone Relocation

Information is based on information pulled from the Remedy Help Desk application -> Telecommunications Group



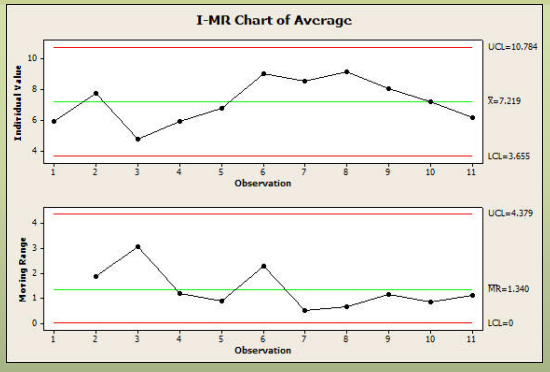
Control Chart for Time to Complete a Telecommunications Work Order

This is a control chart for the average time to complete a telecommunications work order in 2006.

This includes:

- New Analog Phone
- New Digital Phone
- New Phone Line
- Disconnection of Service
- Feature Programming
- Long Distance Access
- Telephone Relocation

Information is based on information pulled from the Remedy Help Desk application -> Telecommunications Group. Sampling and control chart completed using Minitab 14 – Student Release

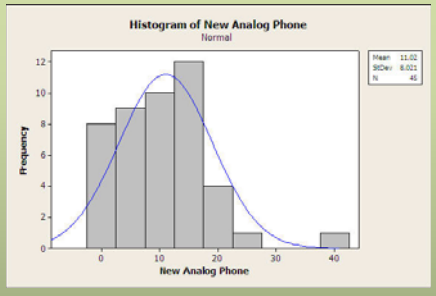


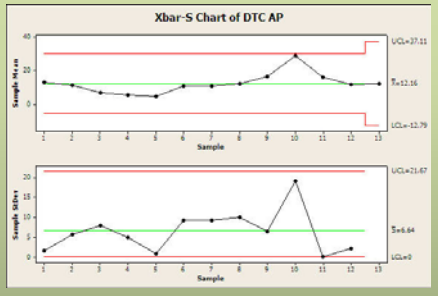
Break down of the Numbers

- For the purpose of this project, the main focus will be on the activation of a new phone line
- On the next few slides, I wanted to look at all work orders to see if there are any noticeable problem areas that could be a big win to also correct or review as part of the process

New Analog Phone

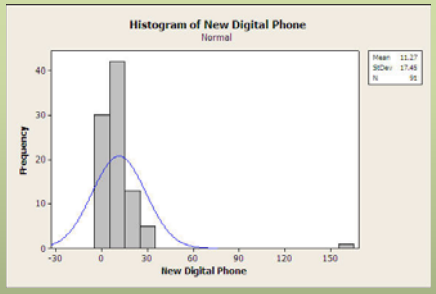
In Control

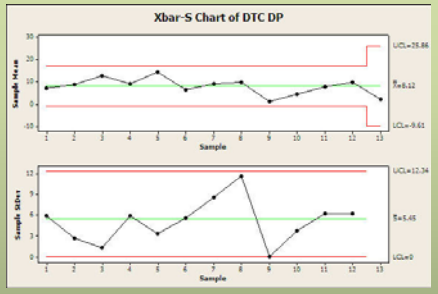




New Digital Phone

In Control

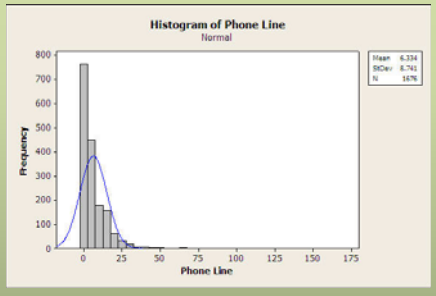


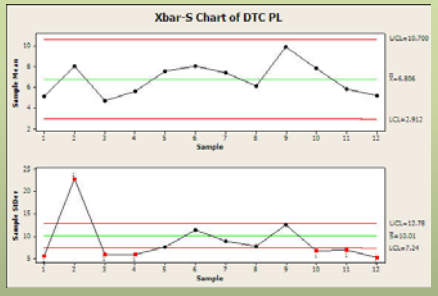


13

New Phone Line

Out Of Control





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New Phone Line

- The goal is to complete the service request in the quickest amount of time, those below the LCL are good.
- The Low point are mainly due to new phone lines needed where a previous phone existed and had not been disconnected driving down the time
- These points were ignored in the search for special causes.

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New Phone Line

- In looking at the S Chart for the data, there are several points out of Control
- In looking at the point above the UCL, I wanted more detail, so I reran the control chart allowing for more points to further define problem areas

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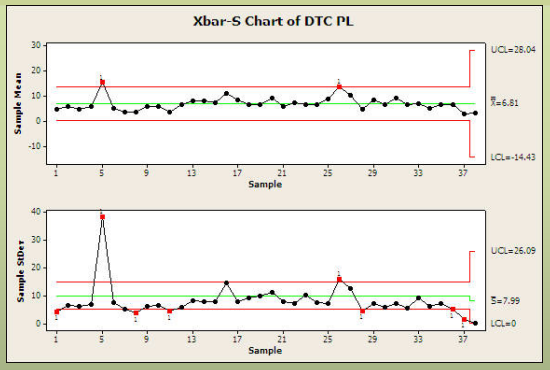
New Phone Line – Detailed Control Chart

In refining the data and picking a point every 20 data points, I was able to better define the problem points. This also caused one more point to pop up above the UCL.

At point five, this point is driven up by a ticket taking 176 Days to complete.

At point twenty-six, this point is being driven up by a ticket taking 66 Days to Complete.



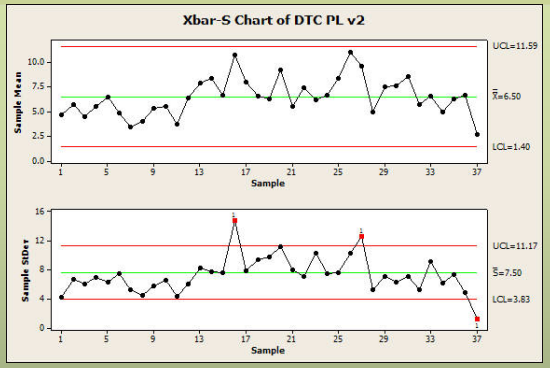
New Phone Line – Detailed Control Chart v2

After removing the first two points due to special causes and further investigation, I reran the control charts with the new data set. This time two new numbers popped out of control.

In sample 16, this was being inflated by a case that took 65 days to complete in June.

In sample 27, this was exceeding the UCL due to a case that took 58 days to complete in September.

I then removed these numbers and reran the control chart again.



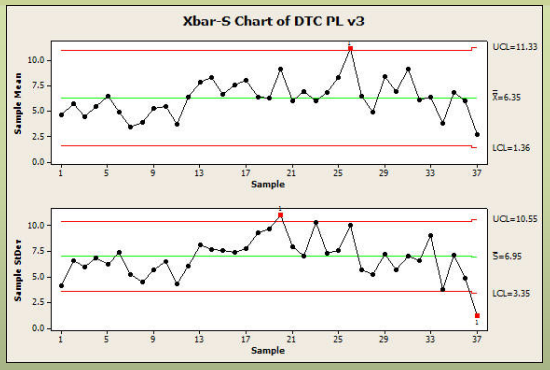
New Phone Line – Detailed Control Chart v3

This time we had a sample go out of control on both the Xbar and the S chart.

At point 20 on the S chart, there was a case in July that took 47 days to complete pushing the sample above the UCL.

At point 26, there was a case in August that took 31 days to complete pushing the sample higher.

After noting the cases to investigate, I reran the control charts.

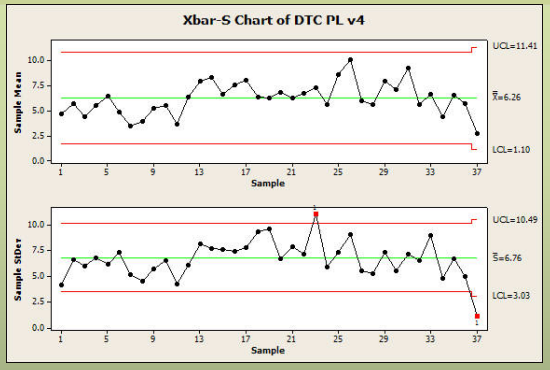


New Phone Line – Detailed Control Chart v4

This time there was only one sample in the Xbar chart that was exceeding the UCL.

This was a case in August that took 44 days to complete.

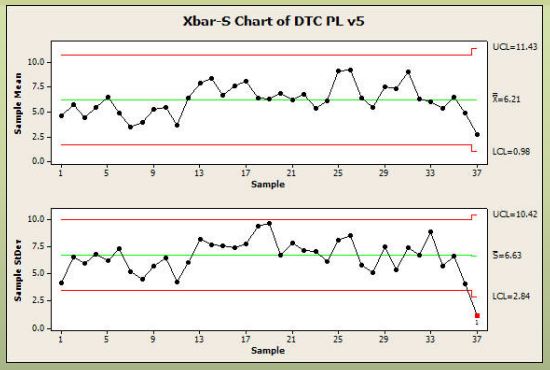
I then noted the case, and reran the control charts again.



New Phone Line – Detailed Control Chart v5

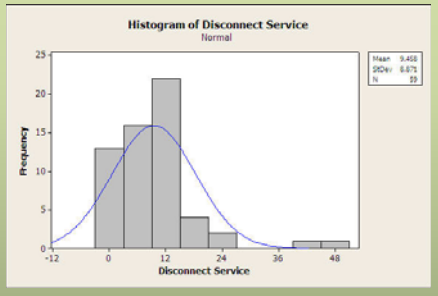
At this point the process is in control.

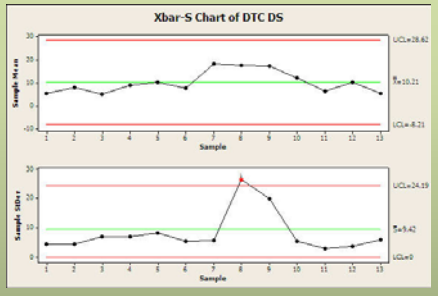
Each of the points removed will be explored to determine why the delay in responding to and resolving the case.



Disconnection of Service

Out Of Control



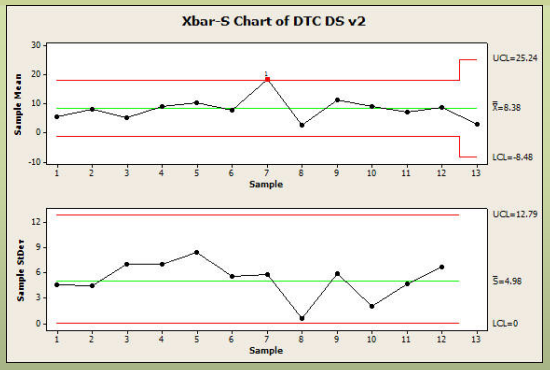


Disconnection of Service Control Charts v2

In reviewing the Disconnection control chart, there are two points that need to be investigated. This includes two dates in July that took 48 and 40 days to complete the work order. These will be investigated further.

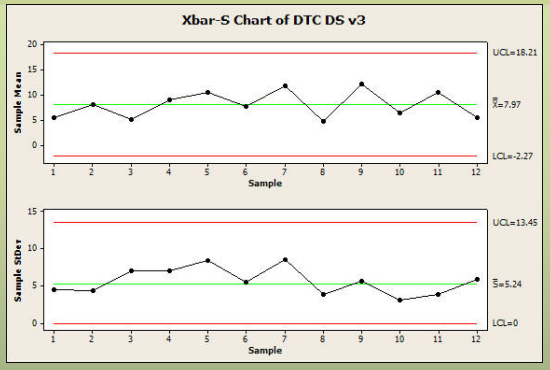
I removed these two dates from the data sets and reran the control chart as shown to the right.

There still is one point that shows the project out of control that needs to be investigated further.



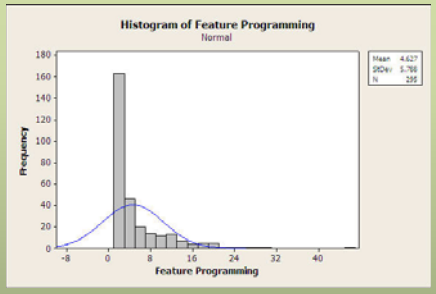
Disconnection of Service Control Charts v3

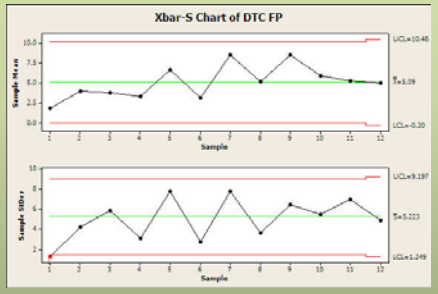
In reviewing the previous control chart, there was one additional date in July that took 23 days to complete the ticket. Once that ticket was marked for investigation, it was removed from the sample and the control chart to the right was developed.



Feature Programming

Out Of Control

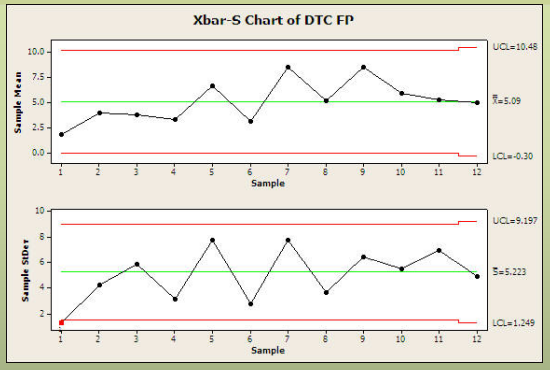




Feature Programming Control Chart

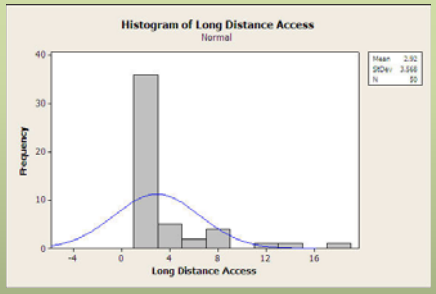
While this chart does show a point outside of the LCL, this is actually desirable. The goal is to try and complete tickets as quickly as possible.

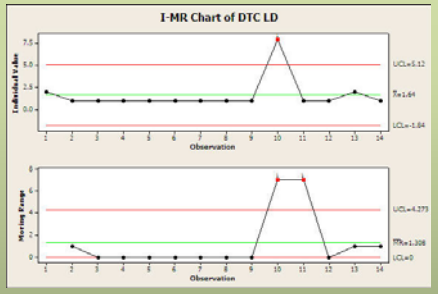
The investigation should center around how to lower all sample points to as low as possible.



Long Distance Access

Out Of Control





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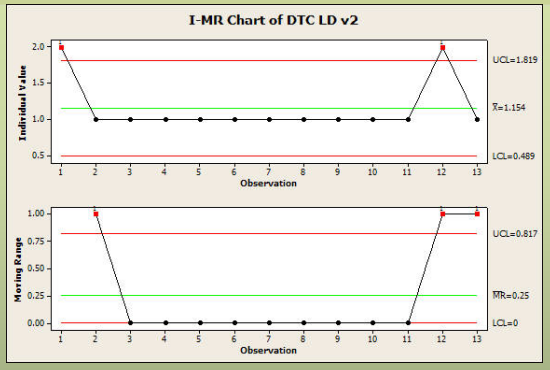
Long Distance Access Control Chart v2

Due to the low number of observations for Long Distance Tickets, I used an I-MR chart.

Based on the findings in the first graph, I found one large outlier of 8 days in August. After removing this from the sample set, I reran the Control Chart and developed the control right to the right.

After removing this one point, all points above 1 day are above the UCL. Since there is a three day estimate to complete on all tickets, then these points are within specification limits of the process.



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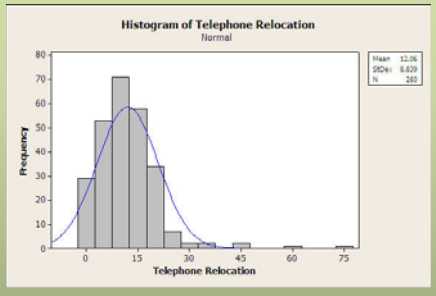
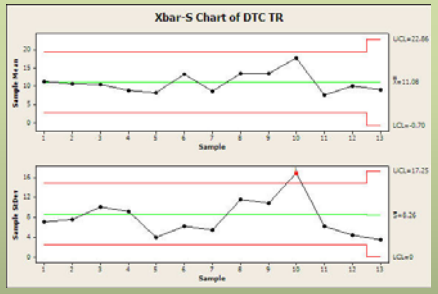
Telephone Relocation

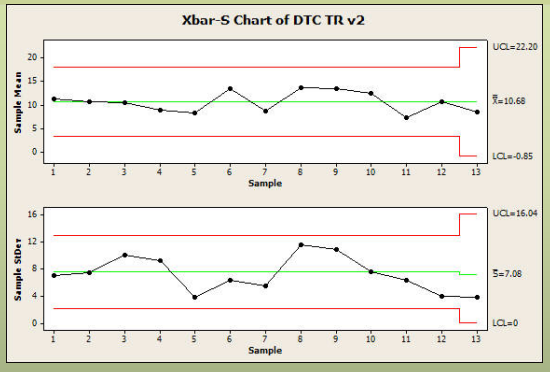
Out Of Control





Telephone Relocation Control Chart v2

In looking at the point above the UCL, there was one data point in the set in which it took 61 days to complete the ticket. Once this data point was noted and removed from the data set, then the process shows in control.



Findings

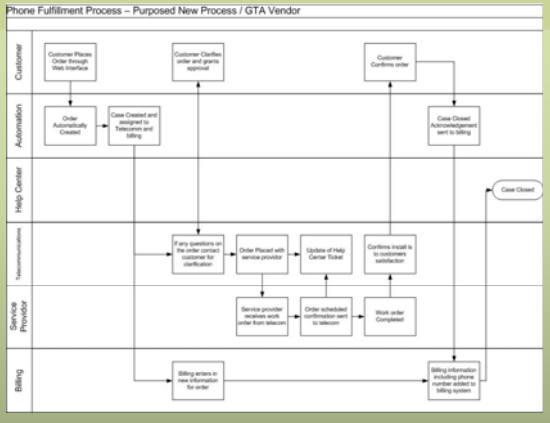
- Need to cut down on the number of categories of tickets – Use New Phone Line only and designate the type of lines
- The outliers are mainly due to user changes – need to determine a process to reduce this change or count
- Issue with vendor delays – this will be taken care of with the new internal phone system to be installed.

Proposed New Process Based on Findings

Based on the findings that I uncovered, and looking at the new automation system, there are a few changes that I would recommend to be implemented.

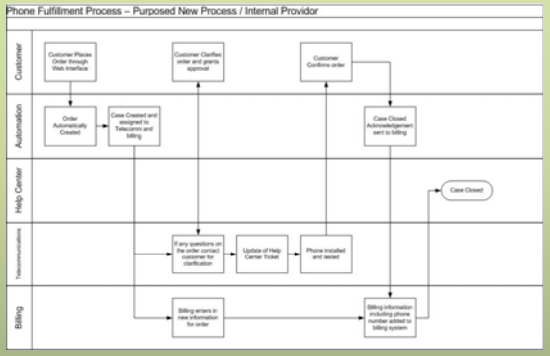
1) Customers will have the ability to open a new case via the web. This will allow all new phone requests to have the same categorization and more standard in look

2) The new cases can be routed to telecommunications and billing at the same time. This will cut down on the delay as Telecommunication waits on a billing order to be entered. Both groups can update the same case.



Proposed New Process when Georgia State has their own Telephone System

At some point this summer, Georgia State will install their own phone system. This will mean that almost all of the service tickets will be completed by Georgia State IS&T staff. Once this happens, then the process can be further streamlined and additional steps can be removed from the process. This will help to insure that at that time IS&T will be able to meet a three day turnaround for new telephone requests, as long as cabling is in place.



Time Cost: Current and New Process

				Current Process		New Process		
Process Steps	Person Performing Task	Rate	Current Process % of Time	Current Process Time	Current Process Amount	New Process % of Time	New Process Time	New Process Amount
Help Desk Case (per Call)	Help Desk Agent	$28.00	100%	0.50	$14.00	40%	0.50	$5.60
Web Case	Web	$4.50	0%	1.00	$0.00	60%	1.00	$2.70
Verification of order	Voice Communication Admin	$22.00		0.50	$11.00		0.50	$11.00
Billing Work Order	Billing Specialist	$17.00		0.50	$8.50		0.50	$8.50
Placing Order with Vendor	Voice Communication Admin	$22.00		0.50	$11.00		0.50	$11.00
Waiting for Fulfillment (per Day)		$25.00		6.80	$170.00		5.00	$125.00
Order verification	Customer / Voice Communicaiton Admin	$22.00		0.50	$11.00		0.50	$11.00
Closeout survey	Web / Help Center	$4.50		1.00	$4.50		1.00	$4.50
Total					$230.00			$179.30

In first defining the cost of the models, I broke down each step and determined the cost to complete. I looked at how by improving the process I could reduce the cost of hours to complete the installation of a new phone line.

Time Cost: Future Process

			Future Process		
Process Steps	Person Performing Task	Rate	Future Process % of Time	Future Process Time	Future Process Amount
Help Desk Case (per Call)	Help Desk Agent	$28.00	20%	0.50	$ 2.80
Web Case	Web	$4.50	80%	1.00	$ 3.60
Verification of order	Voice Communication Admin	$22.00		0.50	$ 11.00
Billing Work Order	Billing Specialist	$17.00		-	$ -
Placing Order with Vendor	Voice Communication Admin	$22.00		-	$ -
Waiting for Fulfillment (per Day)		$25.00		3.00	$ 75.00
Order verification	Customer / Voice Communicaiton Admin	$22.00		0.25	$ 5.50
Closeout survey	Web / Help Center	$4.50		1.00	$ 4.50
Total					$ 102.40

Next I took the same numbers and looked at the cost savings by moving to the future model. By being able to move the phone system in house and reducing the lead time we should be able to reduce the cost by 50% over the model in place today.

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Service Order Costs

	Current Process	New Process	Future Process
Work order Generation	$ 22.00	$ 22.00	$ 55.00
GTA Workorder Fee	$ 32.50	$ 32.50	$ -
Bellsouth Fee	$ 60.00	$ 60.00	$ -
Total	$ 114.50	$ 114.50	$ 55.00

I also looked at the actual cost charged by the providers to complete a new phone work order. While Georgia State University must continue to pay each of the providers in the new process, the new phone system will allow for this cost to be reduced. Even with a larger price to issue a work order, there is still a large cost savings with implementing a self supported phone system.

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Process Support System

Putting the labor and service request cost together helped to build a process support system to determine a cost justification of the new system

The Decision support system is built so that the user can fill out the information in the yellow boxes located at the top of the model.

Once this information is put into the system, then the manager can determine an estimate of cost and time saved among the different models.

Number of Lines	1
Days to Install	3
Type of Order	2
(1 = Help Center, 2 = Web)	

	Current / New Time	Current / New Cost	Future Time	Future Cost
Order Reception		$ 14.00		$ 4.50
Verification of Order	0.50	$ 11.00	0.50	$ 11.00
Billing Work Order	0.50	$ 8.50	-	$ -
Work Order		$ 22.00		$ 55.00
GTA Work Order		$ 32.50		$ -
BellSouth Work Order		$ 60.00		$ -
Fulfillment Time		$ 75.00		$ 75.00
Order Verification	0.50	$ 11.00	0.25	$ 5.50
Closeout Survey (Help Center)	1.00	$ 4.50	1.00	$ 4.50

APPENDIX

Out of Control Cases

CTI	Date	DTC	Ticket Number	Comments
Relocation	9/13/06	61	264708	Move rescheduled by customer and later cancelled
Long Distance	9/12/06	8	264462	Delay with the vendor (GTA)
Disconnection	7/27/06	48	257000	Delay with the vendor (GTA)
Disconnection	7/28/06	40	257060	Delay with the vendor (GTA)
Disconnection	7/10/06	23	254783	Delay with the vendor (GTA)
Phone Line	2/1/06	176	000035	Test ticket by System developer
Phone Line	8/29/06	66	262227	Due date changed by the user
Phone Line	6/23/06	65	252959	Due date changed by the user
Phone Line	9/11/06	58	264235	Due date changed by the user
Phone Line	7/20/06	47	256291	Multi-line order in new space
Phone Line	8/30/06	31	262499	Install of cabling required
Phone Line	8/11/06	44	258769	Due date changed and cancelled by the user