# Case Study :
## Applying Six Sigma to Administrative Processes

**"Loan Processing Takes Too Long"**
>> **Complaints from:**
>> Retail Sales Centers
>> and Home Buyers

**"Too Many Errors in Processing"**
>> **Complaints from:**
>> Credit Managers
>> Retail Sales Centers
>> and Regulatory Auditors

**"Excessive Overtime Hours"**
>> **Complaints from:**
>> The Controller Group

### ISSUES:
- Wrong Forms
- Missing Forms
- Incomplete Financial Information
- Incomplete Credit Schedules
- Wrong Interest Rate Quoted
- Typo's
- Incomplete Customer Information

that were plagued with high processing costs and customer complaints. The initial attention was given to the Loan Processing Department located in a partially owned financial subsidiary. This department was selected for "Six Sigma" application due to the seemingly large number of complaints from major customer groups, including retail sales lots, credit managers, the controller, home buyers, and regulatory groups. The major classification of complaints were as follows:

* Long loan-processing times (by the retail lots and home buyers)
* Errors in processing (by credit managers, lots, and regulatory auditors)
* Excessive overtime hours (by the controller group)

## Applying Six Sigma in a Business Process

At a manufacturer of prefabricated housing, Six Sigma improvement efforts in the manufacturing and design processes had been successful. Thus, a decision was made to use a similar approach to work on addressing business areas

A macro-level flow of the process and its major areas is provided in Figure 1. Loan packages are sent from retail centers (i.e., lots) to loan processing. Within the Loan Processing Department, information is logged and payment schedules are generated. Loan processing operates on a weekly schedule, with a weekly deadline, or close, for final approval and "booking" of loans. The main metrics that the depart-
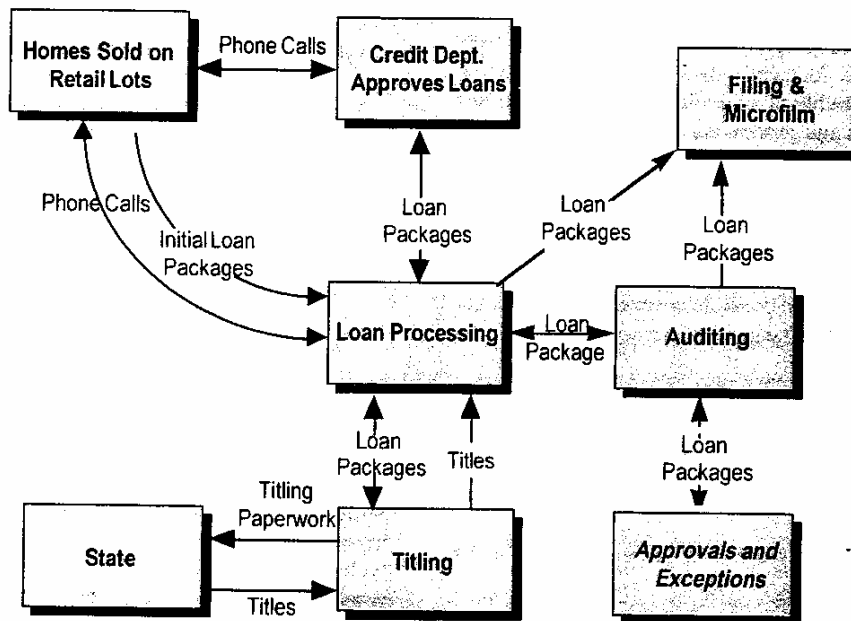


*Figure 1.* Macro flow diagram of loan packages.

ment reports to senior management are total "deals" booked per week (along with total dollars lent) and payroll costs. Payroll costs have been given much recent attention, as overtime hours are targeted as a part of a focused initiative to reduce business unit overhead costs.

### Getting Started

Improvement efforts began with the identification of a process owner and a team of individuals representing various stages of the loan-processing area of the process. This group began by working to prioritize the key customers of the process and their requirements. Based on this understanding, they developed an initial process mission statement: *To process loan packages timely and accurately*. Simultaneously, key process inputs from suppliers and outputs were summarized. This work is summarized in the worksheet provided in Figure 2.

Issues faced during this stage of work were as follows:

1. Current metrics (and therefore behaviors) do not reflect the customer requirements identified.
2. No data are available to provide initial information on process performance or to identify where work should be directed with respect to cycle times or errors.
3. Loan packages are processed across multiple functional areas, as shown in Figure 1. The requirements identified in the process worksheet of Figure 2 indicate that work focused only within loan processing will not be capable of achieving expected reductions in cycle times and processing costs.

### Issues with Obtaining Process Data

In order to understand how well the process functioned currently and to highlight areas in which to focus work, the team began to identify possible response measures for the loan-processing area. The proposed measures include the following:

- Total cycle time of each loan with a breakdown of the cycle time into activity times at each work station and queue times
- Number of processing errors and the classification of those errors
- Total labor hours per week divided by number of loans processed

With each of these measures, there were barriers or dilemmas associated with the collection of the data. To discuss

data on loan package errors, an auditor was included in the next team meeting. The discussion revealed that auditing did complete an auditing worksheet for each loan audited, but it did not record or track the errors by number or type. Therefore, the team sent a memo to the auditing manager request- ing that the auditors collect data on the number and types of error. The manager refused the request, explaining his own pressure to reduce payroll costs. To resolve this barrier, it was necessary to involve the Vice President of Operations in a joint meeting between auditing and the loan-processing team.

In order to obtain data efficiently on cycle times and activity times, the team wanted the computer to log the time that each computer screen was entered. Unfortunately, the Information Systems (IS) Department had such a backlog of requests, a formal cost–benefit proposal with approval from senior management was required to get new programming requests into the short-term (60–90 days) IS schedule. In order to begin getting cycle time data, the team installed a temporary, manual data collection process via data/time stamping upon receipt of loan and upon placement of package in outgoing internal mail.

Finally, the team knew that past data on number of loans booked per closing and payroll hours existed in payroll. Upon obtaining and charting the data, there did not seem to be any correlation between the number of loans processed and payroll hours. The team was unable to suggest an alternate measure.

Issues faced during this stage of work were as follows:

1. The need for involvement by additional functional departments in order to obtain data on desired response measures.
2. The direct labor costs are not representative measures for understanding real processing costs and associated causes.
3. Historical data provided little information to help understanding of the variation in loans processed or causes for long cycle times.

### Learnings from Initial Data Collection

Simultaneous to process mapping and flowcharting activities, data were obtained on cycle times and processing errors. The knowledge gained via data collected on errors, cycle times, and phone calls is summarized in Table 1. Some of the knowledge was obtained via the analysis of the data; however, several discoveries came from the attention given to processing conditions over the course of data collection.

Process: Loan (Deal) Processing
Process Owner: Steve
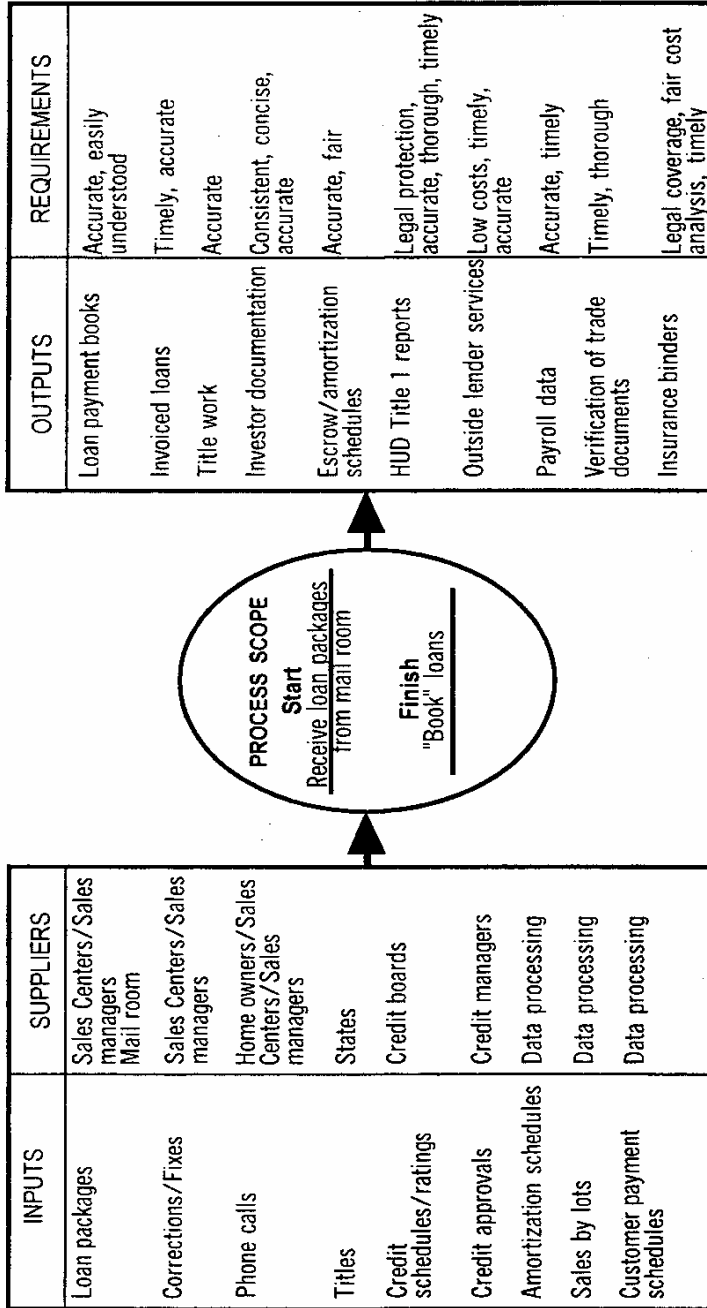Process Team: Angela, Mike, Beka, Carol

| INPUTS | SUPPLIERS |
| --- | --- |
| Loan packages | Sales Centers/Sales managers Mail room |
| Corrections/Fixes | Sales Centers/Sales managers |
| Phone calls | Home owners/Sales Centers/Sales managers |
| Titles | States |
| Credit schedules/ratings | Credit boards |
| Credit approvals | Credit managers |
| Amortization schedules | Data processing |
| Sales by lots | Data processing |
| Customer payment schedules | Data processing |

**PROCESS SCOPE**
Start
Receive loan packages from mail room

Finish
"Book" loans

| OUTPUTS | REQUIREMENTS |
| --- | --- |
| Loan payment books | Accurate, easily understood |
| Invoiced loans | Timely, accurate |
| Title work | Accurate |
| Investor documentation | Consistent, concise, accurate |
| Escrow/amortization schedules | Accurate, fair |
| HUD Title 1 reports | Legal protection, accurate, thorough, timely |
| Outside lender services | Low costs, timely, accurate |
| Payroll data | Accurate, timely |
| Verification of trade documents | Timely, thorough |
| Insurance binders | Legal coverage, fair cost analysis, timely |

*Figure 2.* Loan processing input/outut worksheet.

*Table 1.* Process Discoveries from Data Collected

| METRIC | DISCOVERIES | SUSPECTED CAUSES |
|---|---|---|
| Cycle times | • Majority of average total cycle time due to a small number of loan packages with extremely long cycle times | • Amount of time spent in auditing<br>• Time to get "fixes" for errors made by lots<br>• Multiple phone calls to and from lots often required for one "fix" |
| Errors (assigned to lots and loan processing) | • Majority of errors due to mistakes at lots<br>• Number of errors differed by type of loan<br>• Types of error did not differ by type of loan<br>• Errors differed significantly across the different lots<br>• Four types of errors accounted for approximately two-thirds of lot errors | • Complexity of loan packages, especially for FHA and HUD<br>• Lack of training for retail center personnel<br>• Poor communication to lots on requirement changes for loan applications<br>• Poorly written and obtuse instructions |
| Phone calls and faxes per loan | • Multiple phone calls required to obtain a single piece of information<br>• Majority of calls were "pleas" to obtain an exception to requirements or to process an incomplete loan package<br>• A few lots accounted for a large number of the overall incoming phone calls | • Pressure to meet close deadline (i.e., to get the money)<br>• The success of the pleas!<br>• Certain sales managers requested exceptions repeatedly and consistently |

Spurred by the information that a large percentage of total cycle time was being assigned to his process, the auditing manager requested the expansion of the team and mission to include the auditing process. He also suggested that the auditing error data should include not only errors made in loan processing but also mistakes made by lots in the initial compilation of data. Immediate work began to understand the frequent backlogs in auditing and the flows of information among auditing, retail lots, and loan processing. Subsequently, an additional measure, the number of
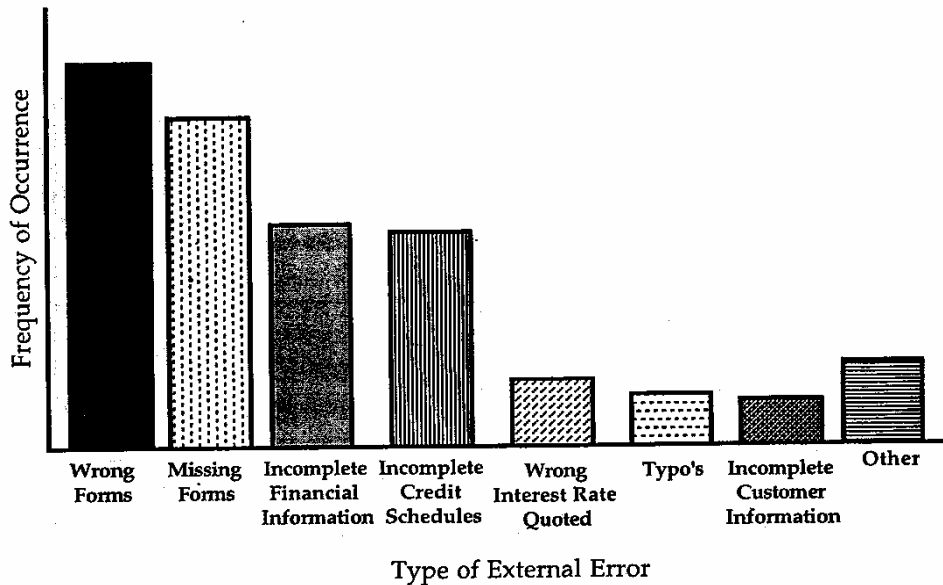


Type of External Error

*Figure 3.* Pareto chart of error types.

phone calls (and faxes) per loan and associated reasons, was instituted.

When looking at the data on errors, possible causes for the differences by type of loan were unerstandable. As explained in Table 1 and shown in the Pareto of Figure 3, there were a few types of error that accounted for the majority of the mistakes made by the lots. With the permission of the VP of Operations, proposed changes to reduce these error types were presented to senior management. For example, to deal with missing forms, the team proposed preassembling loan packages prior to sending the blank forms to the lots. In the past, the lots were merely sent boxes of individual forms. With the proposed change, the lots would receive completely assembled packages for each type of loan.

Although causes for the differences by loan type were fairly obvious, the reasons for differences between lots were much more difficult to explain. All lots received the same forms and the same instructions and processed the same types of loan. The team members obtained the necessary approvals to actually visit retail lots to understand the lot-to-lot differences they saw in their data.

The data on phone calls were difficult to collect due to the fact that many calls circumvented the process areas and went directly to managers. Still, the data confirmed that multiple phone calls were required frequently to obtain information to correct one error. Also observed was that the majority of calls were "pleas" to process an incomplete or incorrect loan in order to meet a close deadline (e.g., to receive the associated monies). It was further evident that for some of the retail lot managers who consistently made phone calls, the calls progressively went to higher levels in the organization. One manager made over 10 calls in a 24-h period of time. The first one started with the loan-processing supervisor. The final call was to the president of the organization! As a result of these insights, frustration began to grow among the team members. As long as pleas from sales managers continued to work, sustaining any type of change in the process would be impossible. The lots had no incentives to cooperate. The team began to question the inconsistent adherence to approval criteria for bookings and the reason for the existence of the "Exceptions and Approvals" department (see Figure 1).

Issues faced during this stage of work were as follows:

1.  Focus on process causal structures resulted in the examination of organizational and management practices.
2.  Proposed changes and work to understand causes (e.g., travel to lots) cost time and money. The work was not free to the organization.
3.  The retail lots, the suppliers to the process, were also the key customers of the organization.

### Initial Results and Team Recommendations

The preassembly of loan packets and rewritten instructions for the lots were credited with a 55% reduction in external errors. As a result, phone calls for fixes were reduced by over 20% and overtime hours for the Loan Processing Department were reduced by over 15%. Obtaining these validated improvements allowed the team the opportunity to present the following ideas and challenges dealing with the larger, organizational issues to the senior management team.

1.  The visits to the lots revealed that some lots had personnel dedicated to loan application preparation. Those who required their sales personnel to complete the loan packages all had a similar perception—it is their job to sell and loan processing's job to complete the loan packages. A quote from one sales representative was, "I do my job. I'd like to know what you do. We all have to do our part."

    Changing perceptions at the lots is the responsibility of management. As long as all communication to the lots is focused on "making sells" (via prizes and bonuses for most homes sold), perceptions and expectations will not change.

2.  The pressure to process incomplete loan packages was partially due to the internal pressure to manage cash flows from investors. Managers increased "bookings" by the only means available to them—"Exceptions and Approvals." Thus, if weekly numbers were falling below the goal, managers allowed a certain number of incomplete loan packages to be processed. Those sales managers who had established relationships with internal managers often were granted exceptions.

    Such practices needed to stop. Incentive structures needed to change. Without changing these behaviors, further reduction in overtime would be impossible. All data collected pointed to excess hours spent tracking down sales personnel to get additional critical information for already approved packages. Also, as long as these practices continued, the Auditing Department would continue to be a "holding" department for loans waiting for corrections and fixes.

3.  The Loan Processing Department had *always* functioned as a batch process where the loan packages are passed between desks in batches of 20–25 loans. Each person hired is trained for one particular area of processing—a person to assign loan numbers, one to input information, one to obtain payment schedules, and so forth. Given this processing structure, those at the "end of the line" always incurred the heavy overtime hours. Those at the beginning frequently had idle time toward the end of the day.

Lean manufacturing principles were just as applicable to an administrative process as they were to the manufacturing areas. In fact, the team wanted to visit the manufacturing sites to explore lean manufacturing concepts, such as one-piece flow, cellular manufacturing, and balancing of workloads. However, managers who had been in the company for many years felt strongly that the current processing structure was the "right way" to process loans. Without the support of senior management, continued efforts to explore such fundamental changes would be wasted.

### Continued Efforts and Unresolved Issues

After much debate and discussion, the team was ordained to continue work to understand the applicability of lean principles to their own processes. Additionally, the team was provided the needed support to begin working with individuals from the retail lots to develop ideas for improving communications and relationships with the lots. The issues with respect to incentive structures and inconsistent managerial practices were left unresolved. Without a doubt, the continued work would continue to highlight these issues.

## Conclusion

Even without proactive intent to address common implementation issues, the application of Six Sigma techniques still provided some gains in both process knowledge as well as reduction in costs. The ability to achieve improvements and to sustain gains are tied directly to the desire by the organization to change and the willingness to deal with issues and barriers as they are encountered. In this company, certain organizational behaviors demonstrated this desire. These included the following:

1. Senior management were involved throughout the improvement work. All new process questions, knowledge, and directions for work efforts were discussed with senior managers.
2. As a result of behavior 1, senior management sup-

ported the idea of making major, yet fundamental changes to functional responsibilities.
3. The improvement work was not confined by a sequential step-by-step approach to problem-solving. Thus, concepts from lean manufacturing, ideas from business process reengineering, and variation reduction techniques were utilized as needed to achieve the desired results.
4. Measurements were established that were relevant and representative of process performance. Functional metrics and managerial reporting metrics (e.g., monthly cash flows) were subordinated to the process measurements for the purpose of process management.
5. Due to the involvement from high-level managers, the improvement efforts did not stay within the boundaries of loan processing. Data were collected and changes were made across locations, functions, titles, and individuals.

These keys to successful implementation are relevant across all processes, especially business and administrative ones. If they are not in place, improvement efforts in business process areas cannot thrive. When they exist along with a decision to implement a data-driven improvement approach, such as Six Sigma, each and every issue faced is much easier to overcome.

## References

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