

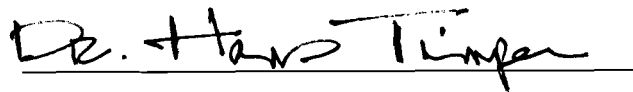
PROCESS MAPPING OFFICE ACTIVITIES OF A SMALL MECHANICAL  
CONTRACTOR FOR PROCESS IMPROVEMENT  
AND ENHANCEMENT OF SUCCESSION PROCESS

by

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A handwritten signature in black ink that reads "Dr. Hans Timper". The signature is written in a cursive style and is positioned above a solid horizontal line.

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**ABSTRACT**

Balco Services, Incorporated is a mechanical contractor located in Greenville, Wisconsin. The president and chief executive officer of the company will be retiring in late 2006 or early 2007 and the executive vice president will be taking over the reins of the company. There will also be a few other retirements of office staff during this time frame, so there will be a shuffling of responsibilities among the office staff at Balco Services, Incorporated.

The purpose of this project was threefold: 1) to study the back office processes at Balco Services, Incorporated with the intent of improving those processes; and to provide reference materials to: 2) help the staff make the transition to their new responsibilities, and 3) assist the

executive vice president in gaining a wider understanding of the activities and processes of the office staff, as his involvement has primarily been in the mechanical trades part of the company.

This paper will document: relevant literature related to process and value stream mapping, and succession planning; the methodology that the researcher followed in doing the project; results of the study of the office processes and recommendations for changes; and conclusions that the researcher has come to in the process of doing the project.

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## CHAPTER ONE: RESEARCH PROBLEM AND OBJECTIVES

### *Introduction*

This field project was completed at Balco Services, Incorporated (BSI) located in Greenville Wisconsin. The project developed process maps of back office activities, with the goal of improving those processes, and to provide reference materials as part of BSI's succession process.

### *Overview of this Thesis*

This chapter states the introduction to the thesis, including the background, problem statement, objective, significance, and limitations of the study. Chapter Two reviews the history and most current literature available concerning process mapping, process improvement, and succession processes. Chapter Three outlines the methods of process map development used in this study. Chapter Four presents the results of the study. Chapter Five performs an analysis of the study, drawing conclusions and recommendations for future research.

### *Statement of the Problem*

Develop process maps of back office functions for Balco Services, Incorporated with the goal of improving those processes, and also to provide the improved process maps as reference materials as part of Balco Services, Incorporated's succession process.

### *Objective of this Study*

The objective of this study is to develop process maps of back office activities, then analyze some of the work processes by using value stream mapping, looking for ways to improve the processes. This will be followed by development of recommendations for changes in the processes. Testing of proposed changes to check their efficacy will follow, and a decision made



to adopt or reject the changes. Finally, the improved processes will be mapped, and will provide reference materials for BSI to use as it goes forward with its upcoming management changes.

### *Significance of the Study*

The study will benefit BSI and other small companies looking to improve the efficiency of their back office activities, and provide the future management of BSI with reference materials for how those activities are done, thereby easing the transition to the newly configured management team.

Some of the benefits that could be achieved through the implementation of this study are:

1. Reduction in labor costs in back office activities
2. Reduction in opportunity costs for office and management personnel
3. Quicker turn around time on accounts receivable
4. Quicker response time on requests for bids by potential customers
5. Increase in productivity of office staff
6. The management team will benefit from the reference material provided by the process maps as they go through a shifting of responsibilities
7. The executive vice president will benefit by having the process maps to refer to, as he transitions into ever greater responsibility for the “big picture” at the company

### *Limitations of the Study*

1. Findings of the study are limited and only directly applicable to BSI.
2. The study is intended to demonstrate the process and experiences involved in developing process maps for BSI. While similar companies are likely to involve similar processes and experiences, each case will have its own unique particular benefits and challenges.

3. The study is not meant to develop process maps for every single activity that BSI partakes in. The processes that were chosen were those that BSI management felt would provide the most value to the company, in regard to process improvement and succession planning.

### *Assumptions*

1. The individuals involved in the study are assured that the changes in processes are an attempt to improve the system.
2. BSI personnel will provide honest and accurate answers to questions.
3. BSI will not make significant changes to its back office activities during the study, other than those involved with and suggested by the study.
4. BSI personnel will be cooperative in providing accurate information.
5. The company will continue to use the same computer hardware and software during the period of the study.

## *Definition of Terms*

### *Back office:*

The administrative staff of a company who do not have face to face contact with the company's customers (Powerhomebiz.com, n.d. Glossary section B, para. 2).

### *Lean enterprise:*

A Lean Enterprise produces more with existing resources by eliminating non value added activities. Manufacturers are facing increased worldwide competition and the stakes are high. The winners in this competition work to eliminate overproduction caused by traditional scheduling systems and only make what customers want when they want it (NIST-MEP, n.d. para. 1).

### *Process mapping:*

Process Mapping, often referred to as Flowcharting, is a graphic representation showing all the steps, actions, and decision points of a process (pacepilot.com, n.d. Process Mapping, para. 1).

### *Succession planning:*

A means of identifying critical management positions, starting at the levels of project manager and supervisor and extending up to the highest position in the organization (Rothwell, 2001, page 6).

### *Value stream:*

A value stream consists of everything that is involved in making the transformation of raw materials and information to what the customer desires; the communication along the supply chain regarding orders and forecasts of orders; and the network of processes

through which the information and materials flow, both in time and space, as they are transformed into what the customer desires (Tapping and Shuker, 2003, page 33).

*Value stream mapping:*

Value Stream Mapping (VSM) is a tool to support its associated analysis. VSM thus can be simply stated as the method by which the outcomes of Value Stream Analysis are depicted or illustrated. The VSM of a process serves to describe a highly complex real system in a less complex 2-D format. This simplification of the system facilitates insight and understanding, and provides a common language for communication of that insight (McManus and Millard, 2002, Introduction, para. 2).

*Methodology*

The process will begin by planning which back office functions will be studied. This determination will be made by the researcher and BSI management by deciding which processes hold the most potential for improvement. Then interviews will be held with the appropriate BSI employees to develop process maps of the present state for the selected activities.

Selected processes will then be studied by using value stream mapping as a tool to find waste and delays. Improved processes will be discussed with BSI employees and management, trialed, and either accepted or rejected as new practices.

The revised process maps will be presented to BSI as reference materials which will assist the company in its succession process as it deals with retirements of key personnel in the next year.

## CHAPTER TWO: REVIEW OF LITERATURE

### *Introduction*

This chapter will review literature pertinent to the study and application of lean principles, the value stream and value stream mapping; and succession planning.

### *History of Lean*

Manufacturers in the United States have always looked for ways to improve efficiency, lower costs, gain competitive advantage, and increase market share. Prior to World War II, manufacturing methods accentuated processes and mass production. After the War, the focus of production systems shifted to outputs and results, trying to exploit economies of scale (MAMTC, n.d. Introduction section, para. 1-3).

In the aftermath of the War, Japanese companies faced a scarcity of finances, labor, and material. The unique problems that they faced led to development of lower cost manufacturing practices that minimized waste. Toyota developed its process focused production system, the “Toyota Production System” also known as “lean production”.

In the early 1990’s lean began to be adopted by some United States companies after the publication of “The Machine That Changed the World” by Womack, Jones, and Roos. The book described the elements of lean that allowed Japanese auto manufacturers to outperform their United States and European counterparts. Lean was used to describe the production methods because they used less labor, materials, time, space, and capital to provide the end products. Lean production is gaining ever wider use by American companies.

### *Lean Principles*

*Value:* In lean, the value of a product or service is defined solely by the customer. The product must meet the customer’s needs at a specific time and price. All the other activities that

the company does to deliver the product or service are not of interest to the customer. A company must comprehensively analyze all of its processes by looking at value from the eyes of the customer, identifying activities into three types; those that add value; those that do not add value but can not be eliminated, and those that add no value and can be eliminated. By eliminating processes that do not add value to the customer, processes can be optimized (MAMTC, n.d. Value, para. 1).

*Continuous improvement:* Transition to lean does not happen immediately. A mentality of continuous improvement is necessary to reach lean (MAMTC, n.d. Continuous improvement, para. 1-2). Continuous improvement means incremental improvements of all processes, products and services over time, to improve functionality, service or performance.

*Customer focus:* A lean company is more concerned with its customers' needs rather than its own internal production considerations (MAMTC, n.d. Customer focus, para. 1).

*Perfection:* A lean enterprise considers there to be endless opportunities for improvement in the use of all its assets (MAMTC, n.d. Perfection, para. 1). Pursuing these opportunities systematically reduces operating costs and allows delivery of maximum value at minimum price to the customer. Perfection is an ever elusive goal, striving for it maintains a constant vigilance against waste.

*Focus on waste:* Lean aims to eliminate waste in all areas of the company's activities. Its goal is to use less of everything: labor, inventory, time, and space; to respond to customer demand ever more efficiently, and producing top quality products and services as economically as possible (MAMTC, n.d. Focus on waste, para. 1-10).

### *Typical Types of Waste that Lean is Concerned with*

- Overproduction
- Waiting
- Inventory or work in process (WIP)
- Processing waste
- Transportation
- Motion
- Defective products
- Underutilization of people

### *Lean Throughout the Enterprise*

The key principles of lean are: perfect quality the first time, eliminating all activities that do not add value, minimization of waste, continuous improvement, flexibility in the organization, and long-term relationships (Defense Acquisition University, n.d. Lean, para. 9).

Until recently, most lean efforts have been focused on improving manufacturing productivity. However, the non-production areas of an enterprise have great potential for improvement in efficiency and productivity gain. Not only are the production activities part of the value stream, but also the flow of information and the problem solving involved in meeting customer desires. Since they are part of the value stream, they should be scrutinized to eliminate non value added activities, just as much as the production activities are.

A major part of the problem in applying lean principles to the office setting is the difficulty in applying systems thinking in identifying value, waste and flow in the office (Keyte and Locher, 2004, page xiii). Many organizations have adopted new ideas such as lean concepts

for their production facilities; new ideas for the office have primarily consisted of reorganizations and new information technology systems, with relatively limited effectiveness.

The goal of lean efforts is to eliminate non value added activities or processes, and one of the best tools for identifying them is value stream mapping.

### *Value Stream Mapping*

Value stream mapping is used to create a map of the material and information flows involved in a product or process. It begins with development of a current state map, which shows the steps involved at this time. Then, based on the current state map, and using lean principles, a plan is developed to get to the future state map, which is a streamlined process, which should reduce lead time and operating costs.

### *Mechanics of Value Stream Mapping*

- Present state map
  - Draw processes
  - Quantify
  - Identify wastes
  - Analyze wastes (can they be eliminated?)
- Future state map
  - Develop implementation plan
  - Implement and test for efficacy
  - Make corrections if necessary



### *Benefits of Value Stream Mapping*

Value stream management is not a method for telling people how to do their jobs more effectively. It is a systematic approach that empowers people to plan how and when they will implement the improvements that make it easier to meet customer demand (Tapping and Shuker, 2003, page 12). This involvement and empowerment of the people doing the work is essential to the success of the value stream mapping process. The value of treating people with dignity and respect can not be overstated, and is vitally important to the development of a lean culture throughout the enterprise.

### *Succession Planning*

Succession planning establishes a process that recruits employees, develops their skills and abilities, and prepares them for advancement, all while retaining them to ensure a return on the organization's training investment (Office of Personnel Management, n.d. para.3).

Succession planning also describes management positions to provide maximum flexibility in lateral management moves and to ensure that as individuals achieve greater seniority, their management skills will broaden and become more generalized in relation to total organizational objectives rather than to purely departmental objectives (Rothwell, 2001, page 6). This broadening of management skills as a person rises in the organization is important so that a "big picture" view of the organization as a whole is developed, and an appreciation of the importance of all departments' activities toward the success of the organization.

## CHAPTER THREE: RESEARCH METHODOLOGY

### *Introduction*

This field project was completed at Balco Services, Incorporated located in Greenville Wisconsin. The project developed process maps of back office activities, with the goal of improving those processes, and to provide reference materials as part of BSI's succession process. The objectives of the project were to help BSI be more competitive in its market by using the concepts of lean in its back office activities, shortening lead times and improving office efficiency.

This chapter will cover the research methodology, the personnel interviewed, and how the interviews were conducted.

### *Research Methodology*

The methodology for this field problem included:

- A review of literature pertaining to:
  - Process mapping
  - Lean concepts
  - Value stream mapping
  - Application of lean to office operations
  - Succession planning
- Interviews with pertinent BSI employees
- Development of process maps for the present state
- Verification of validity of process maps with BSI employees
- Conversion of process maps to value stream maps
- Analysis of value streams in present state, looking for waste

- Development of improved value streams
- Proposal to BSI of trials for improved value stream
- Trial of improved value streams
- Decision to adopt or reject new value stream by BSI management
- Development of revised process maps reflecting adopted new value streams
- Presentation of finalized process maps to BSI to use as reference material for succession process

*Personnel Interviewed*

Personnel interviewed were BSI employees and included:

- President & CEO
- Executive Vice President
- Vice President - Pipefitting
- Corporate Secretary - Comptroller
- Service Dispatcher
- Service Supervisor
- Accounting Clerk

### *Process Map Development and Accuracy Checks*

Beginning on Friday May 19<sup>th</sup>, 2006 and continuing for a number of Friday mornings, interviews were conducted with selected employees of BSI. These interviews were used to develop process maps of back office activities at BSI, using the flowcharting capabilities of Microsoft Excel. After the process maps were developed, a reality check was done with the BSI employees, to ensure the accuracy of the process maps.

Process maps were developed for the following activities:

- Call processing and service dispatch
- Work order data entry
- Purchase order – Project work
- Purchase order – Service work
- Balco invoicing – Project work
- Balco invoicing – Service work
- Cash receipts – Project and Service
- Bid proposal process
- Project flow after bid acceptance

These process maps were used by the researcher as the basis for development of value stream maps to improve the back office activities; and as reference materials for BSI to use as it goes through a period of management change and rearrangement of duties owing to the upcoming retirement of the company president.

Process maps use flowcharting symbols to follow the steps involved, from start to finish, in completing an activity, such as work order data entry. A completed process map gives an easy to follow, graphic representation of an activity or process.

### *Conversion to Value Stream Maps and Analysis*

After the process maps had been developed, certain processes were chosen to be converted to value stream maps, as they were deemed to have a high potential for improvement by the researcher and BSI management.

These included:

- Purchase order process – service and project – combined
- Balco invoicing – project
- Balco invoicing – service

The process of converting to value stream maps takes the information from the process map and breaks it down further, showing each step in more detail. For example, a process map for the Purchase Order Process would show a step in general terms such as Accounts Payable Processing, the value stream map shows in detail all the individual activities within the accounts payable process such as:

- Employee involved in each step
- The information technology system or document involved
- The individual steps involved in the processing of documents
- Flow to other's inboxes
- Information flows

Value stream mapping shows all of the activities involved in delivering a good or service to the customer, and focuses on the customer's needs and those activities that add value that the customer is willing to pay for. There are many activities involved in delivery of goods or services that do not add value from the perspective of the customer. Value stream mapping is useful in identifying the non value added activities, so that judgments can be made as to their worth to the company. VSM focuses on the complete process, rather than the individual functions performed. VSM helps identify wastes that add costs to the price of the company's products, so that they can be eliminated or minimized.

Wastes that add cost but no value:

- Overproduction
- Inventory
- Waiting
- Extra processing
- Correction of defects
- Excess motion
- Transportation
- Underutilization of abilities

Normally, value stream mapping also includes numbers of processes done per day and typical time period to complete a particular process. This type of information would be particularly difficult to quantify at BSI. Because of the small size of the office staff at BSI, their need to perform a number of functions, and jump from one to another as the need arises, it was decided to concentrate on information flows, the position performing the process, and the information technology system or document(s) involved. It was felt that most of the wastes could

still be apparent with the information on these “stripped down” process maps. Also the simpler maps would be easier for the BSI staff to understand. The office staff had no prior experience in lean or value stream mapping, and it was beyond the scope of the project to train them comprehensively on lean, so it was important to keep things on a relatively easy to understand level.

### *Development and Proposal to Balco Services, Incorporated of Recommendations for Improved Value Streams*

After development of the value stream maps of the present state of the selected processes, the researcher then analyzed the present state maps, looking for wastes. The analysis was used to develop proposed suggestions and recommendations to be presented to BSI's management and employees. The researcher then met with the employee and management group to discuss the basics of value stream concepts, the findings of the research, and implementation strategies for recommendations that BSI had chosen to pursue.

### *Adoption or Rejection of New Processes*

The discussion of implementation of recommendations led to a decision by BSI management to research new software and hardware systems to replace their current systems which are yielding less than optimal results from the amount of labor input to them. One of the assumptions made at the beginning of the study was that the software would not be changing during the period of the study. Additionally, BSI management and staff decided in the discussion with the researcher that no changes would be made in processes at this time, as many of the processes would be changing when the new information technology systems are implemented. Consequently, no changes to the present state processes were adopted.

### *Development of Revised Process Maps*

No revisions to the present state process maps were developed, owing to the future revamping of information technology systems at BSI.



*Presentation of Process Maps to Balco Services, Incorporated as Reference Materials*

The researcher has presented the process maps developed during this study to BSI to be used as reference materials as they go through a transitional period due to retirement of the company president, with consequent shifting of duties for BSI personnel. The process maps will be a useful reference tool for the executive vice president, who has come from a mechanical trades background and is learning quickly about the activities of the back office. The present process maps should also be useful to BSI as it plans and executes its move to new information technology systems supporting its back office activities.

## CHAPTER FOUR: RESULTS OF THE STUDY

### *Analysis of Wastes in Back Office Activities*

The goal of value stream mapping and subsequent analysis of those maps is to identify wastes and non value added activities so that steps can be taken to eliminate wastes.

Analysis of the present state value streams showed the two primary categories of waste occurring in the back office activities at BSI are extra processing and overproduction.

The primary waste that is occurring is the extra processing that occurs as purchase orders, work orders, accounts receivable and accounts payable records move through the office. The extra processing is primarily due to the lack of direct interface between the software used for work order generation and processing; and the accounting software for accounts payable and receivable. Information from one system has to be manually entered into the other system.

Another waste that the analysis revealed was overproduction, specifically redundancy in filing systems, with a number of filing systems being maintained within the office in order to ensure easy access to information for personnel, depending upon their work function. There are costs associated with maintaining all of these filing systems; such as labor to maintain the filing systems, material costs for paper, toner, filing cabinet, printer and copier costs. This waste is also related to the lack of effective interface between the two information systems employed by BSI.

### *Example of Extra Processing*

The extra processing that occurs because of the lack of interface between the two systems can be illustrated by examining the process for invoicing for service work. The software systems involved are TCMW, which is the accounting software, and Wintac, which is used for work order processing. E-Copy is also used for editing and printing the invoices.

(This value stream map is included in the appendices of this report.)

When a service work order is ready to be invoiced, the service dispatcher:

- Gets the job cost history from TCMW, and reconciles that information with the information on the work order from Wintac
- Prints a draft Wintac invoice
- Places the draft Wintac invoice in the president's inbox

The president:

- Checks and approves the Wintac invoice
- Places invoice in the accounting department inbox

The accounting department (in Wintac):

- Verifies tax information in Wintac
- Adds a 6<sup>th</sup> digit to the Wintac invoice number
- Sets invoice date to the current date
- Prints to E-copy to do editing

The accounting department (in E-Copy):

- Changes invoice number to job number in header of page
- Adds the BSI invoice number (generated by TCMW) to the invoice
- Prints 5 copies of the invoice in differing colors

Copies of the invoice go to:

- The customer
- The alphabetical customer file at BSI
- The numerical job file at BSI
- The job folder at BSI
- The inbox of the trades managers at BSI

The value stream map shows graphically how much extra processing is done, due to the lack of interface and commonality of data between Wintac and TCMW. In addition to the additional processing, all of the manual entry activities introduce the potential for errors in the information transfer.

### *Presentation of Results and Recommendations to Balco Services, Incorporated Staff*

On Friday, September 8, 2006 the researcher met with BSI's executive vice president (future president), and the rest of the office staff at BSI. The meeting agenda was:

- Explanation of the basics of the value stream
- Process map development
- Conversion of process maps to value stream maps
- Explanation of value stream mapping
- Presentation and explanation of present state value stream maps for the selected processes at BSI
- Recommendations
- Brainstorming session for implementation of recommendations accepted

The presentation to the staff was delivered using an overhead projector to show slides of the PowerPoint presentation that the researcher had developed. Handouts of the PowerPoint were also distributed, along with process maps and value stream maps.

BSI's staff members participated actively in the discussion, and were very receptive to learning about the concepts of the value stream and value stream mapping. The executive vice president, who comes from a background in the mechanical trades and until lately has had relatively limited involvement in back office activities commented that the experience was very eye opening for him. The value stream maps were particularly useful for him to understand the complexity and roundabout way that some back office activities are done presently at BSI.

The recommendations were presented in the form of alternatives; which ranged from major to minor changes. Each of the alternatives was discussed briefly in turn; when all had been presented a general discussion of the strengths and weaknesses of each alternative ensued.

*Alternatives Presented:*

- Change to an ERP (Enterprise Resource Planning) – common database system
- Find software that will support the functions now done separately by Wintac and TCMW
- Find an interface program that will move information electronically between Wintac and TCMW, thereby eliminating the manual input necessary now
- Examination of the filing system redundancies, to cut down on the number of filing systems

The first alternative discussed was to change over to an Enterprise Resource Planning, common database system. Discussion of this alternative course of action included:

- ERP advantages
  - Information availability in real time
  - Potential to shorten process times
  - Elimination of most of the manual input that is done presently, with corresponding improvements in accuracy of information
  - The advantages of doing a conversion to ERP while BSI is still a relatively small company
- ERP disadvantages
  - Cost – both software and hardware
  - Great commitment in time and effort to ensure successful implementation
  - Many ERP systems require total revamping of processes, which can cause a lot of discomfort in the organization
  - The history of failed ERP implementations

- Overall, a painful process to go through

Discussion of the second alternative, to find software that supports the functions done independently by Wintac and TCMW, included:

- Alternative 2 advantages
  - Lower cost than ERP software
  - Lower hardware cost
  - Conversion likely to be less involved than ERP implementation
- Alternative 2 disadvantages
  - Will not support as many functions as ERP does
  - May only delay an eventual ERP implementation

The discussion of the third alternative, looking for an interface program between Wintac and TCMW, included:

- Alternative 3 advantages
  - Lower software cost than alternatives 1 and 2
  - No need to train staff on new software – use existing
- Alternative 3 disadvantages
  - Unknown availability of such a program
  - Unknown effectiveness of the interface between Wintac and TCMW

Discussion of the fourth alternative, a thorough examination of the filing systems as they are presently configured included:

- Alternative 4 advantages
  - Lowest cost – no software or hardware changes
  - If filing systems are eliminated, will lower costs

- Alternative 4 disadvantages
  - Does not address the major problem, just treating symptoms
  - Does not address lack of hardware performance

#### *Overall Discussion of the Alternatives*

The discussion after presentation of alternatives centered primarily on the ramifications of the first three alternatives, namely software and hardware changes necessary to change away from the Wintac and TCMW methods used by BSI today. The comptroller brought up the issue of the present hardware running low on memory for archiving of data. All office personnel agreed that wait times for programs and screens to come up were unacceptably long due to lack of performance with the existing server, and that this is hurting their productivity.

The discussion also reviewed the history of the information technology systems that are presently used by BSI, how they were adopted, and who was responsible for their adoption. A former service manager who left the company a number of years ago was the driving force for using Wintac for service dispatching.

TCMW, for accounting functions, was adopted later and the “workarounds” were developed to interface the two programs.

The executive vice president became convinced that an upgrade of BSI’s information technology system is in order. The executive vice president instructed the comptroller to begin an investigation of the factors involved in pursuing the first two alternatives; going to an ERP type common database system for the enterprise, or finding software that will support all of the functions done separately by Wintac and TCMW now.



These factors would include (but are not limited to):

- Hardware costs for new server
- Memory capacity for archiving of records
- Scalability of additional memory in the future
- Software licensing costs – ERP versus just office functions
- Software capability – ERP versus just office functions
- Time frames for conversion and rollout to new systems

The executive vice president thanked the researcher for his efforts, and commented that it was shocking to see just how complicated some of the back office processes were, due to the limitations imposed by the present information systems. His background is in the mechanical trades end of the business, and he is quickly learning about all the specifics of the office processes.

The researcher thanked all BSI's staff for their cooperation and openness in the research and interviewing process, and for their genuine friendliness and cooperation throughout the whole project. With that the meeting concluded.

#### *Presentation of Process Maps to Balco Services, Incorporated*

Part of the project was to develop process maps for BSI to use as reference materials as its office staff go through a transition period following the retirement of the current president within the next few months. There will be a rearrangement of duties within BSI's staff, and it was felt that the process maps could help make that transition period go more smoothly. The process maps will also help the executive vice president to broaden his scope of understanding of the processes performed by the office staff.

The process maps were developed using Microsoft Excel. Since the research did not result in any changes to the processes in the short term, the process maps as initially developed were presented to BSI. The process maps were presented in three ways: as paper copy on 8-1/2 by 11 inch paper in a ring binder, and as Excel and Word files on CD/RW disc and floppy disk in the same binder. The researcher included copies of the value stream maps developed for the project also, both on paper and computer media.

## CHAPTER FIVE: CONCLUSIONS

### *Value of Periodic Examination of Processes and Activities*

It is important for organizations to reexamine their structure and operations regularly to ensure that they are meeting their customers' needs in an optimal fashion. A continuing effort to improve and streamline processes is important to ensure delivery of perceived value to the customer. The tools of lean, such as value stream mapping, can contribute substantially to continual improvement of the activities that a company performs.

The rather convoluted processes followed by Balco Services, Incorporated because of the incompatibility of their software are examples of waste that add to the costs incurred in providing goods and services to its customers, but do not add value from the perspective of the customer. This waste adds costs to virtually every project or service call that the company does, with a negative effect on its bottom line and its competitive position in the marketplace.

### *Power of the Graphic Representation in a Value Stream Map*

Inefficiency and waste in a production process or in a piece of equipment can be fairly apparent, as results are quantifiable. Consequently, past applications of lean have primarily focused on production type activities rather than office activities and processes, but that is changing.

The use of value stream mapping graphically showed waste involved in the processes studied in this project, even though the value stream maps were not totally quantified due to the rather fluid, changing nature of the workload for the relatively small office staff at BSI. Fully quantified value stream maps, where they are possible or practical to develop, can be an even more powerful tool in detecting waste and inefficiency.

The value stream maps' graphic presentation of information flows involved in the processes revealed the complicated nature of those flows more effectively than the process maps did. They also revealed the underlying problem faced by BSI in regard to its back office activities, the lack of efficient interface between Wintac and TCMW. The "stripped down" value stream maps that I developed were easier for the staff and management to follow; and made a particular impact on the executive vice president, which really strengthened his "buy in" to the recommendations.

#### *Unanticipated Results*

When working on a project, one generally has an idea of what the end result should be. However, when doing a research project it is important to keep an open mind; although the research has resulted from a hypotheses and one may have an expected result, sometimes you get a surprising outcome.

While I was working on the presentation of my recommendations from the analysis of the value stream maps, I anticipated that the result of our discussions of the alternatives would be working on implementation of alternative number four, an examination of the filing systems at BSI. I knew that the company had gone through a very negative experience with an ERP implementation back in the early 1990's. As a matter of fact the current president of BSI had muttered something about "over my dead body" during an early discussion that we had when the subject of ERP came up.

In the discussions following my presentation of the alternatives, the executive vice president was amenable to the idea of doing an implementation of ERP, or changing to software that will support work order functions and all of the accounting functions used by the company. This was more than I had expectations for.

Because of his decision to research the first two alternatives, the second part of value stream mapping, the development, testing, and implementation of improved value streams did not happen as part of the project. That was unfortunate for me, as I feel that going through the implementation process would have been an interesting learning experience. Still, having been through the development of value stream maps and doing analysis of the present state maps has been valuable to me. I am hopeful to be able to be involved in the implementation phase of lean initiatives at some future point in my career.

Ultimately, I feel that the path that BSI is pursuing is the best path for their long term benefit, as their information technology systems definitely need improvement, and I am gratified at initiating the process that has started them down that path, which should contribute to their future success.

#### *Observing the Upcoming Changes*

I do have occasional contact with BSI in my present position. I will be an interested observer as they go through the process of selecting the new information technology systems. As their processes change over time or with the adoption of new information technology systems, the process maps can be easily updated and stay current. I would be willing to assist Balco Services, Incorporated in revisions to these maps, as it revises its processes with the rollout of new information technology systems.

#### *The Birth of Lean at Balco?*

I am hopeful that BSI, having been exposed to lean, and especially to value stream mapping, will pursue more lean initiatives in the future. The biggest challenges faced by the company in the near future are the transition to new management and implementation of new information technology systems. In developing the new processes that would result from

transitioning to new information technology systems, I hope that the introduction to lean that I presented to them will be the start of a movement toward lean throughout the company. I am firmly convinced that lean, when implemented in a common sense way, can give a company a competitive advantage in a number of ways, such as lower costs, shorter cycle times, productivity increases, etc.

#### *My Process of Value Stream Map Development*

Looking at my process from the perspective of the end of this project, I am not sure I would follow the same process for doing the value stream map development. The process that I followed, first developing process maps and then developing value stream maps from them did present some challenges.

I found myself needing additional information as I developed the value stream maps, and had to revisit some of the processes. At the beginning of the project I was more familiar with process mapping, so I started with that and then developed my value stream maps. Now that I have gone through the process of developing value stream maps, I am more prepared to do both concurrently, which would minimize the need to obtain additional information.

#### *Succession Process Enhancement at Balco Services, Incorporated*

The succession process dealing with the upcoming retirement of the president had already begun when I started this project, but I have observed the process as I have worked on the project. As the process has progressed, the executive vice president has widened his area of responsibility, while having the current president available to mentor him. This arrangement, at least in my observation, seems to be working very well. The executive vice president is widening his view to the “big picture” necessary for the success of the whole organization. I am hopeful

that the process maps will be a useful resource for the staff at BSI, and will enhance the effectiveness of the succession process underway at BSI.

*My “Big Picture” View*

This project has helped me to expand my overall understanding of the back office activities of a company. In my present position, working in one little corner of a Fortune 500 company, I have not had anything to do with most of the functions and processes studied in this project and report. Having had the opportunity to be exposed to and study these activities was an experience that I would probably never have gotten in my present employment.

I have gained a valuable overview of many important activities that keep money flowing for the firm; and support and facilitate the activities of the employees providing goods and services to the customers of the firm. Studying these activities at a small firm was especially propitious, as everything happens in the same building, and each person performs a number of functions, so I did not have to deal with location issues or department boundaries, as I would have at a larger firm. I feel that the overall view that I got from doing this project at a small firm is probably of more value than the opportunity to do more quantification on the value stream maps that I developed.

I am much in debt to, and have much gratitude to Balco Services, Incorporated for allowing me the opportunity to gain this knowledge. Their openness and cooperation made the journey of this project an enjoyable trip.

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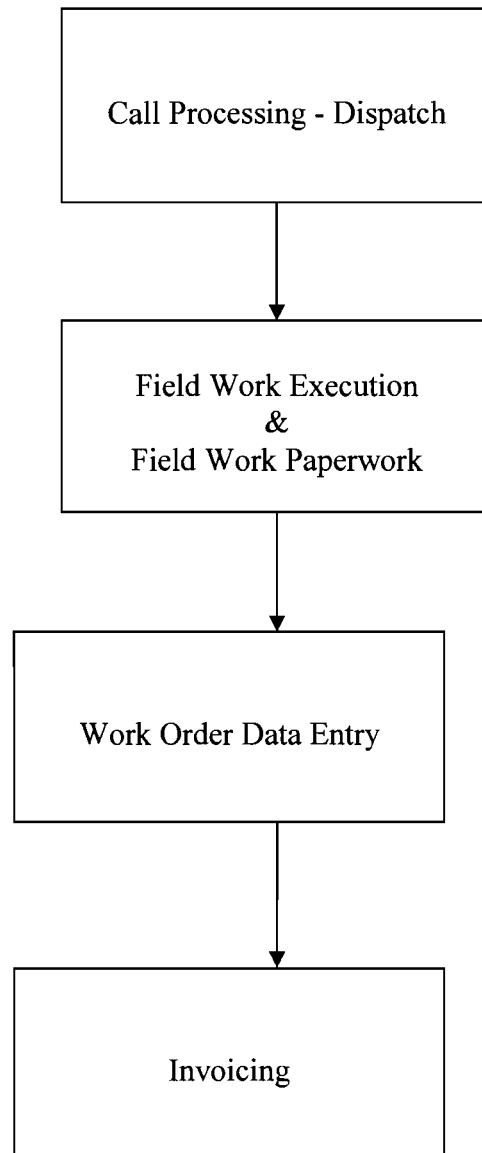
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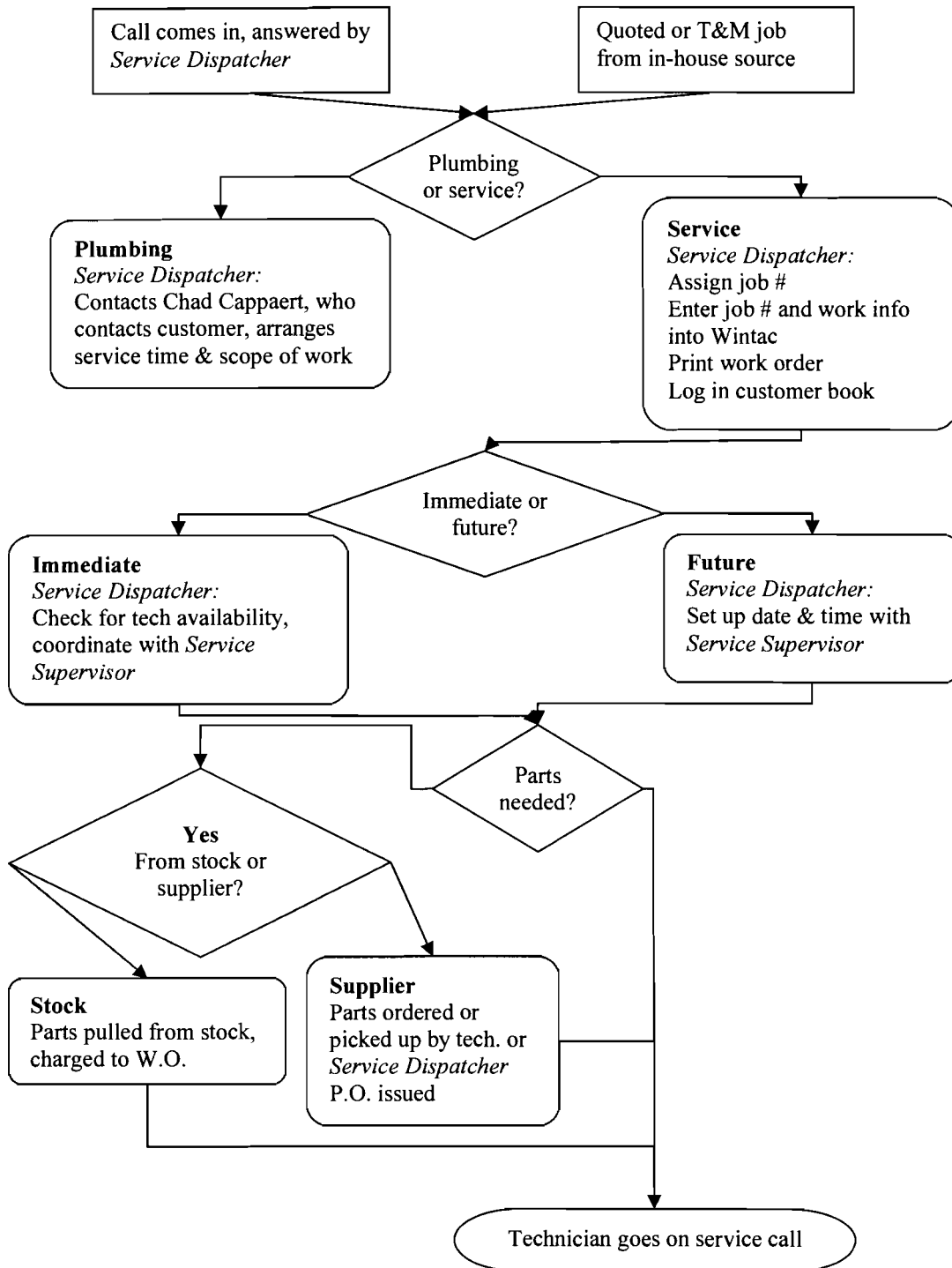
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APPENDIX A – PROCESS MAPS DEVELOPED FOR BALCO SERVICES,  
INCORPORATED

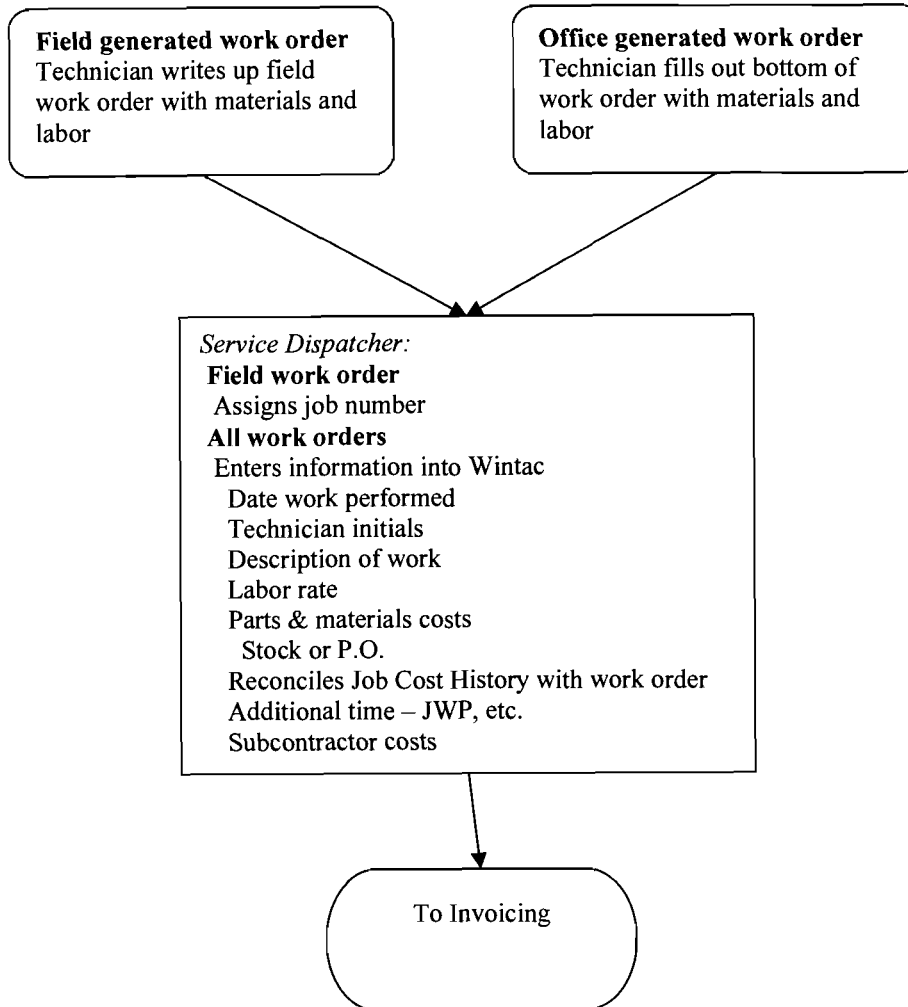
## Service Overall Flow



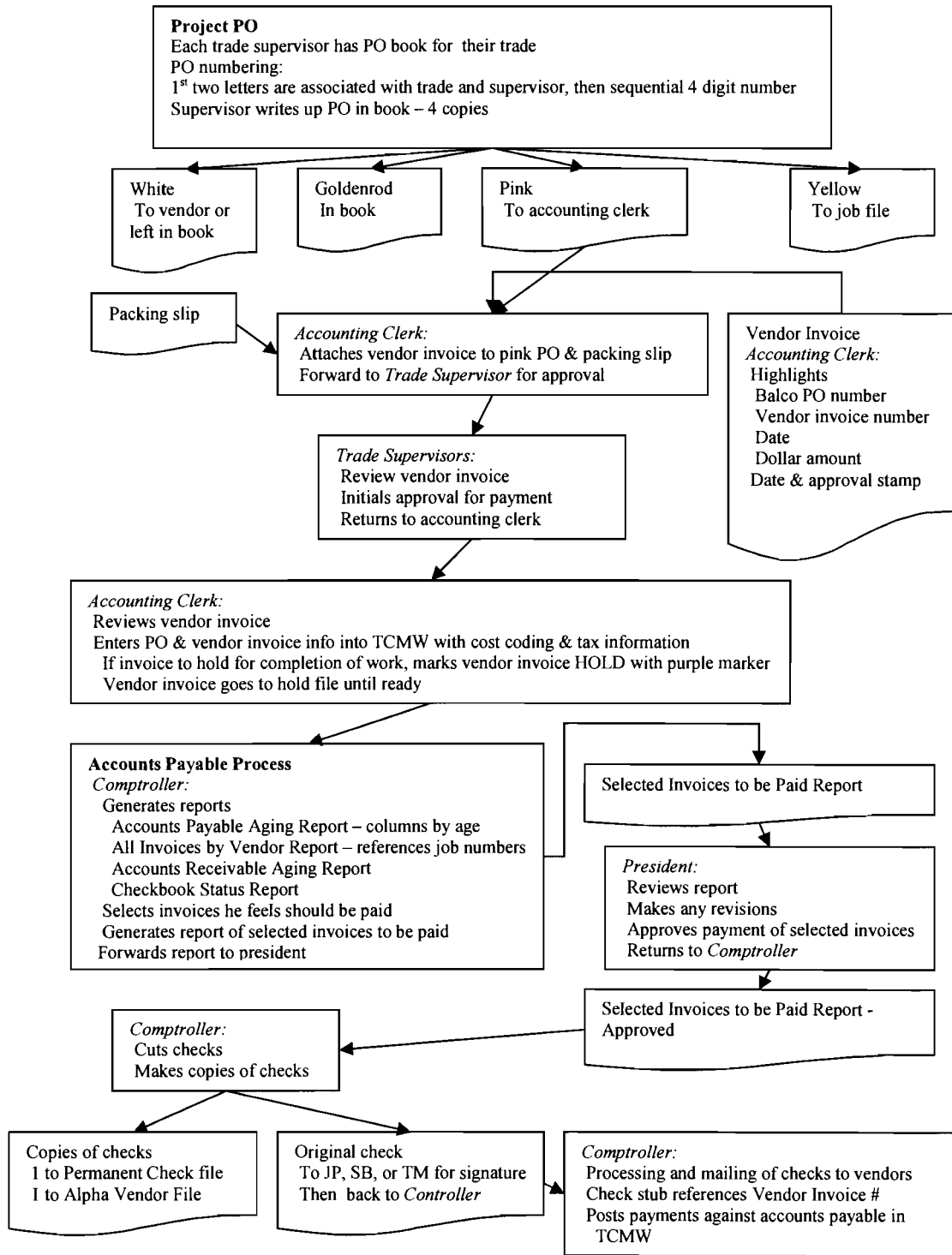
## Call Processing - Dispatch



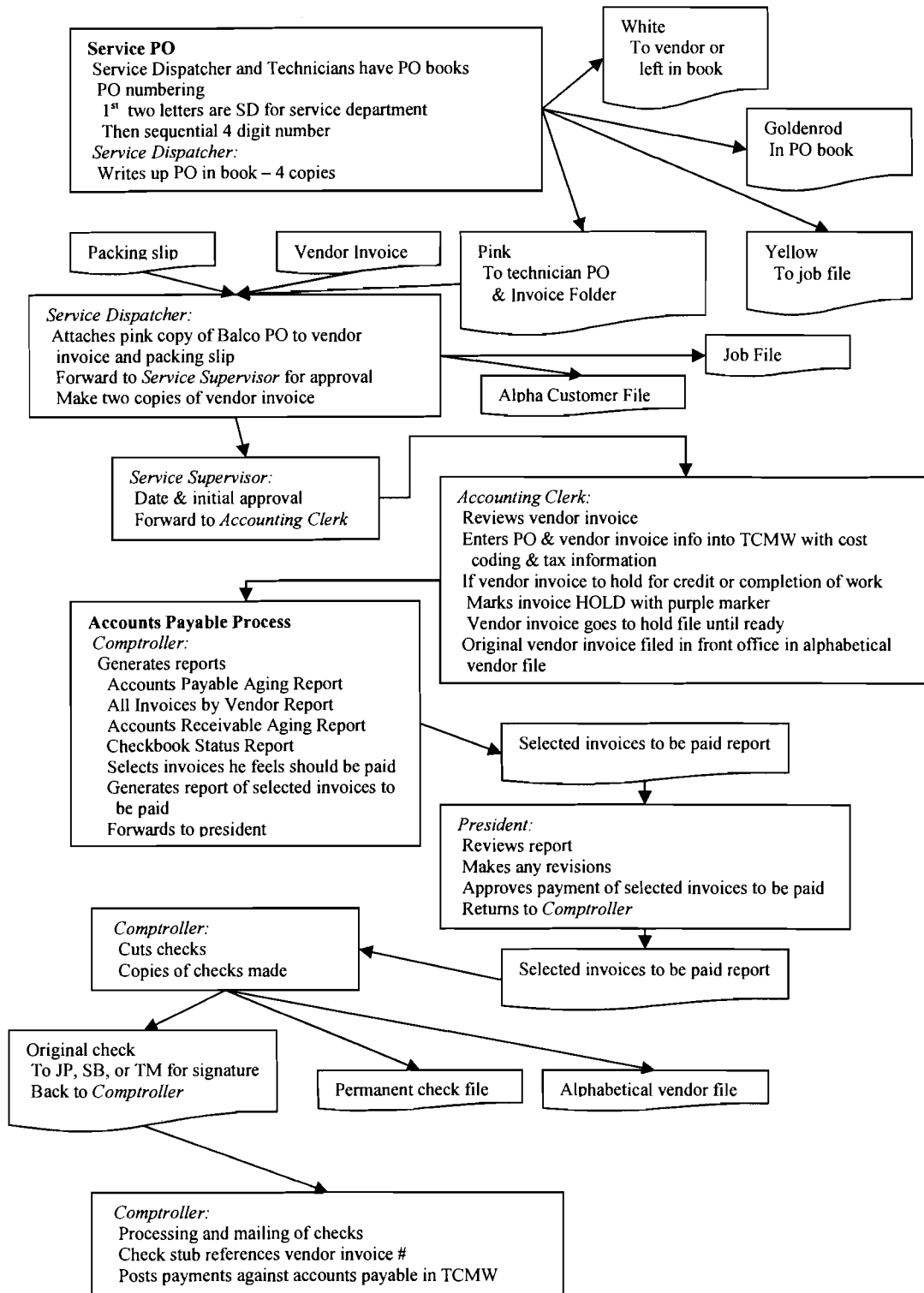
## Work Order Data Entry



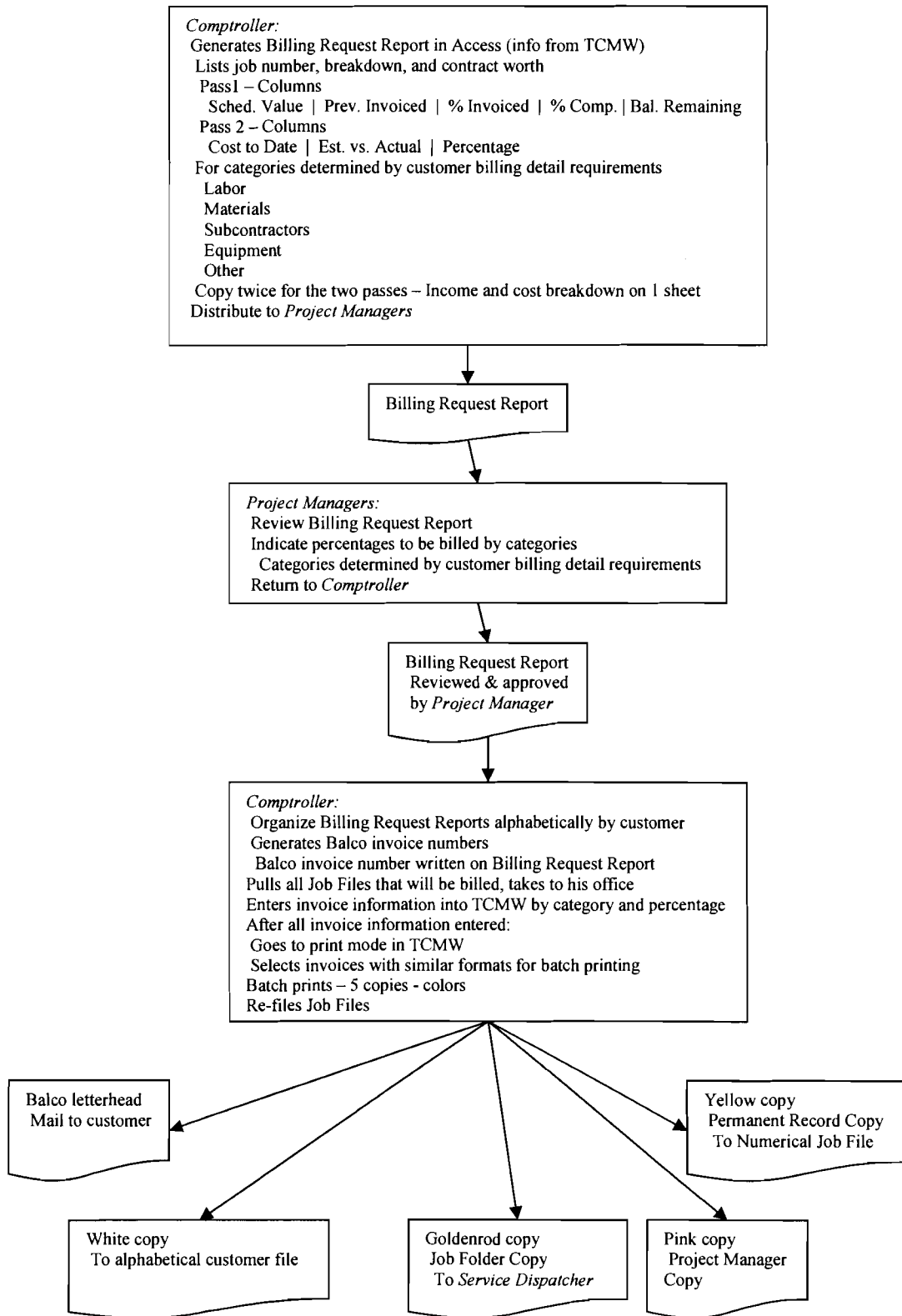
## PO Process – Project



## PO Process – Service

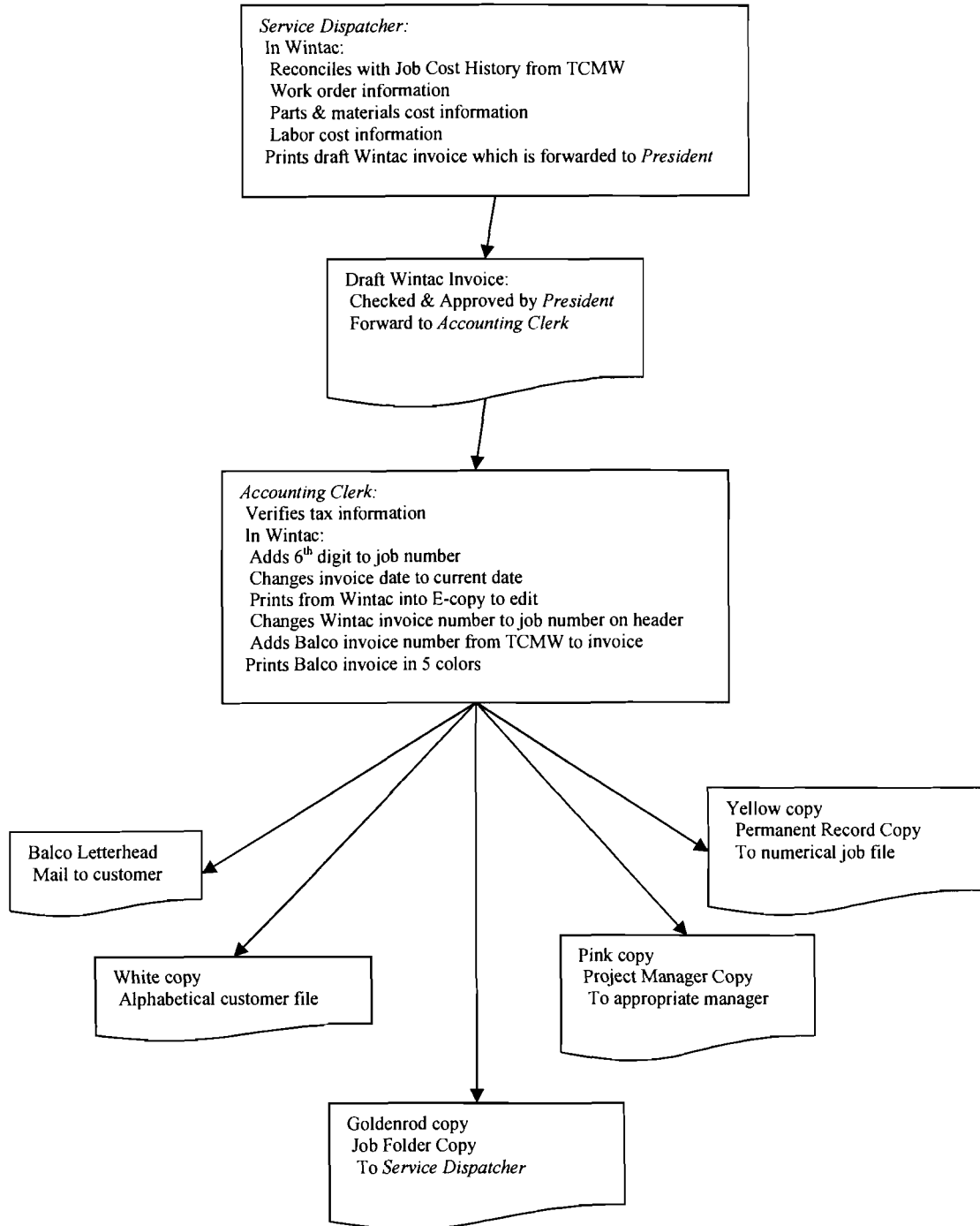


## Balco Invoicing – Project

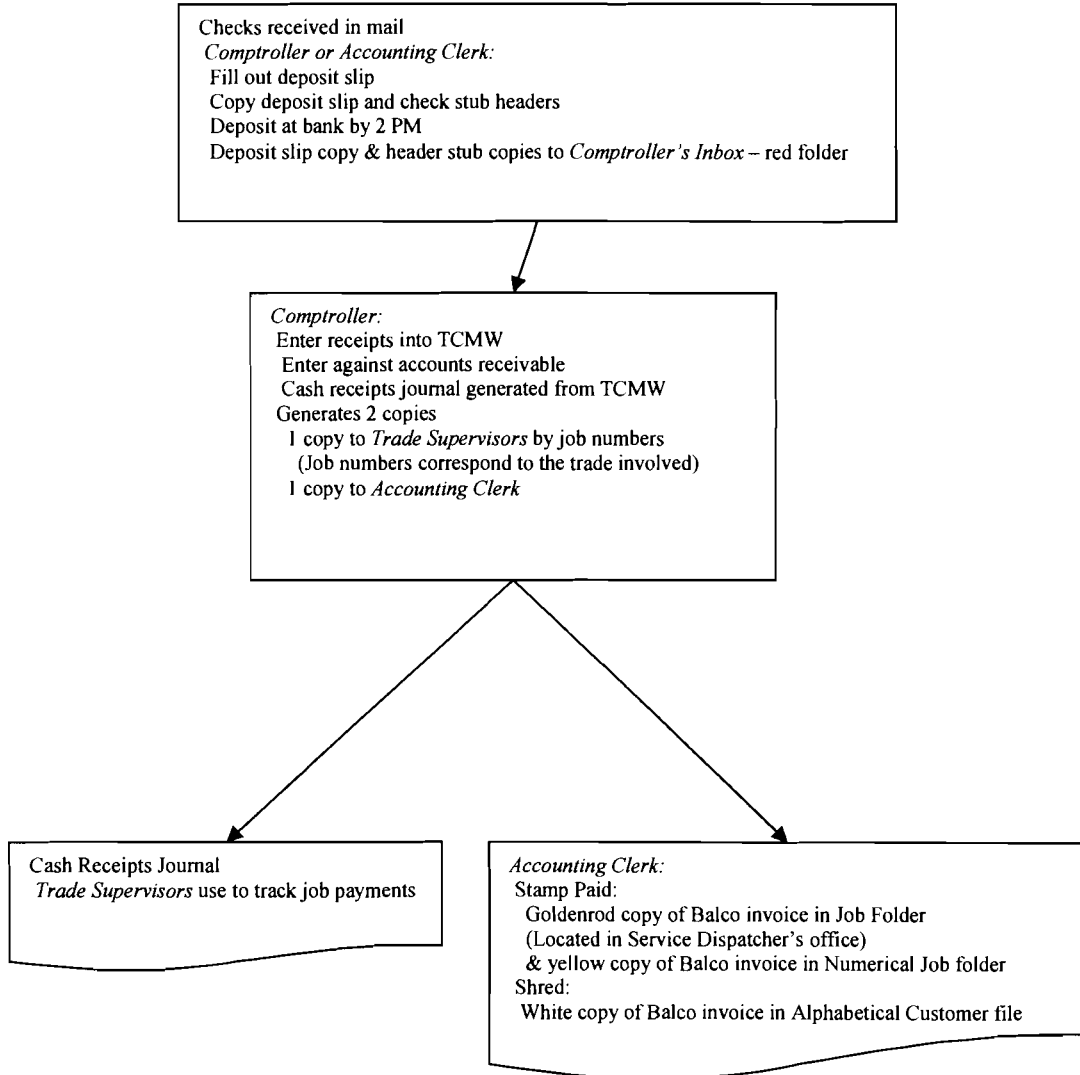




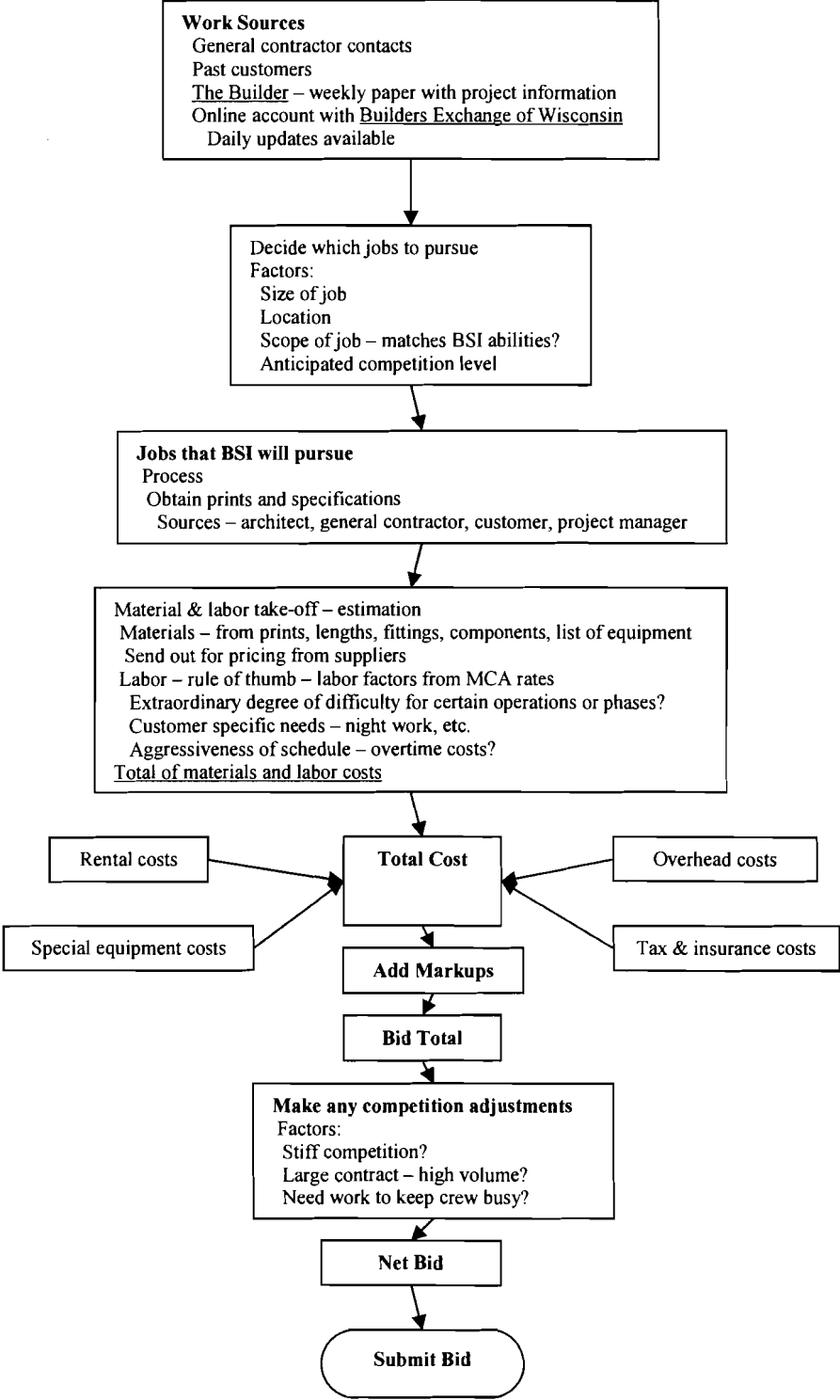
## Balco Invoicing – Service



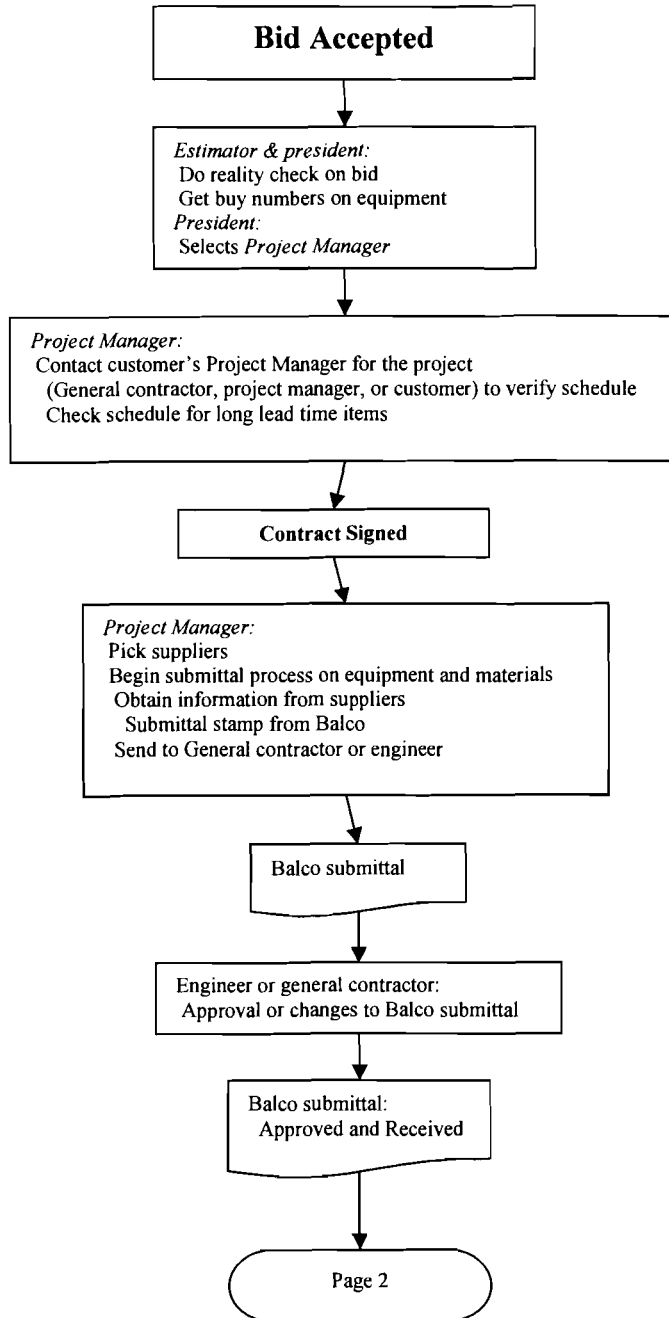
## Cash Receipts – Project & Service



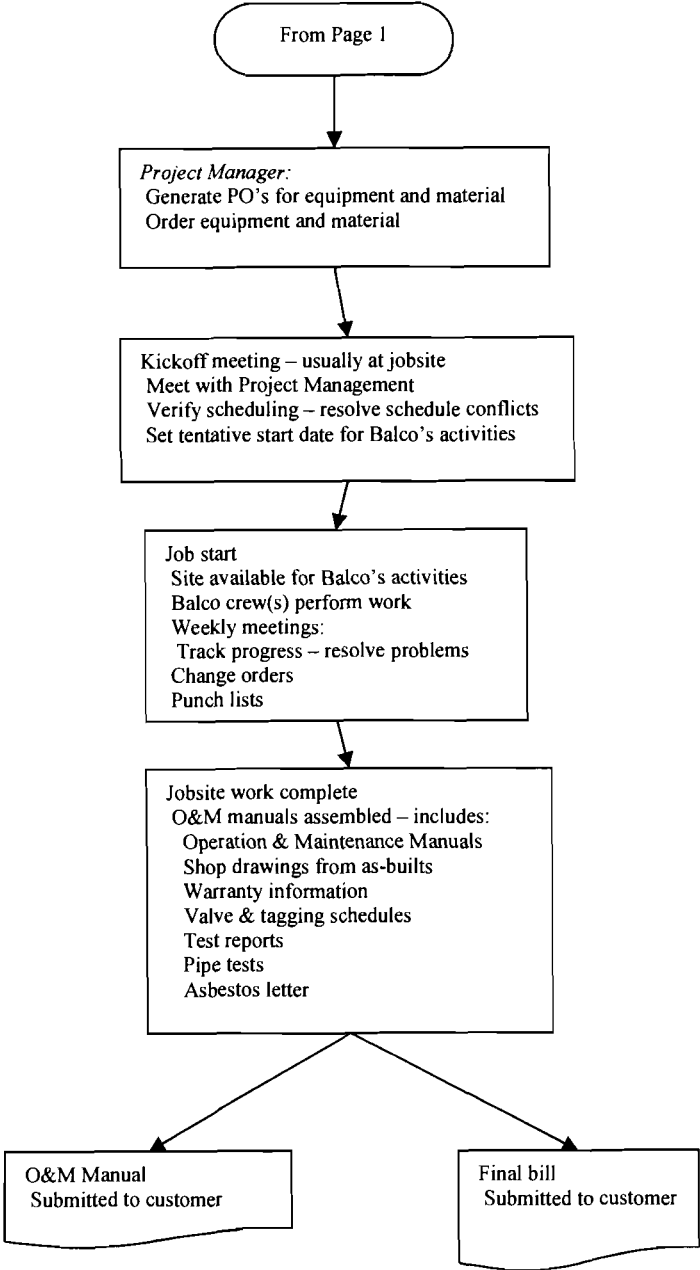
# Bid Process – Which to Pursue & Cost Determination



## Project Flow after Bid Acceptance

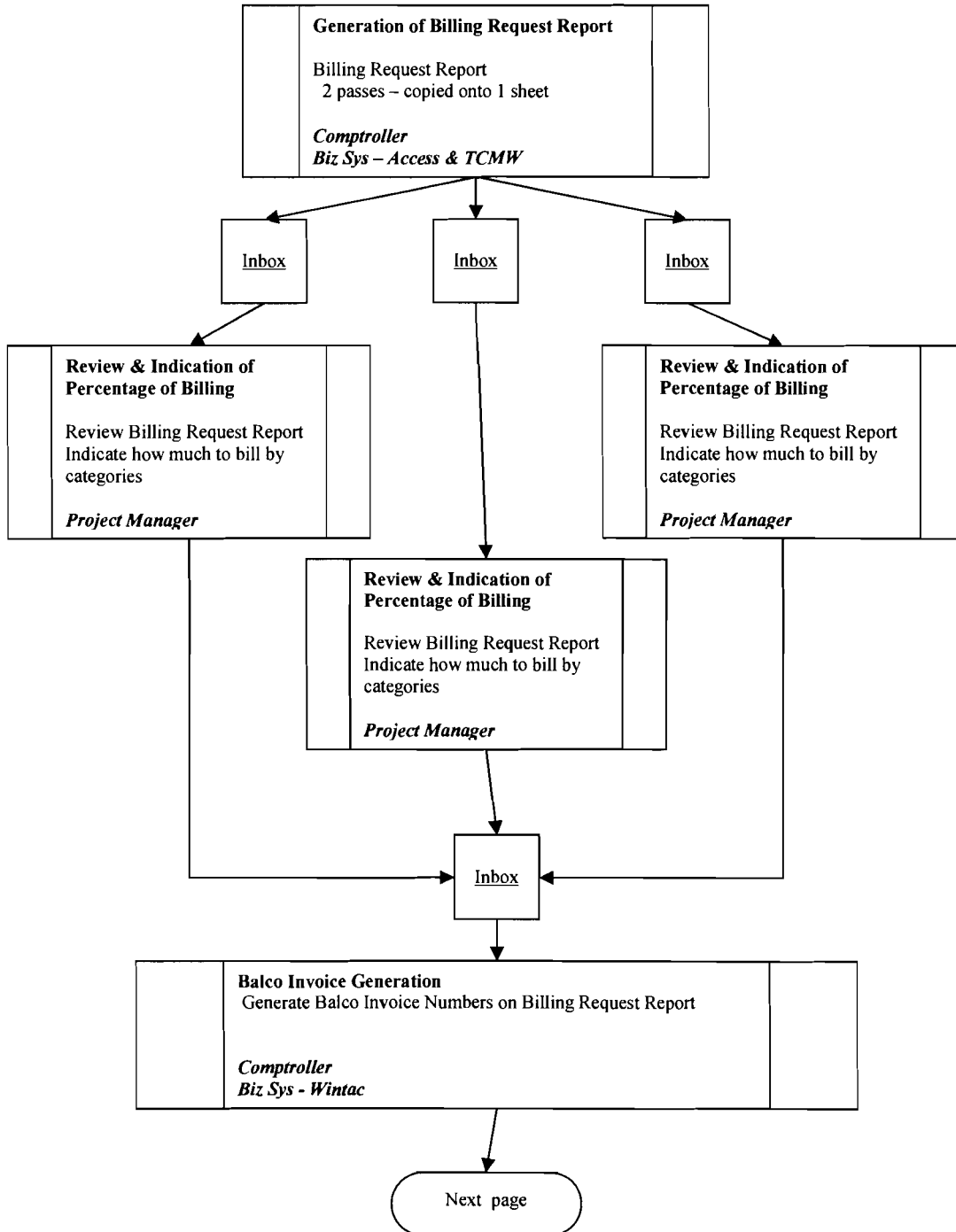


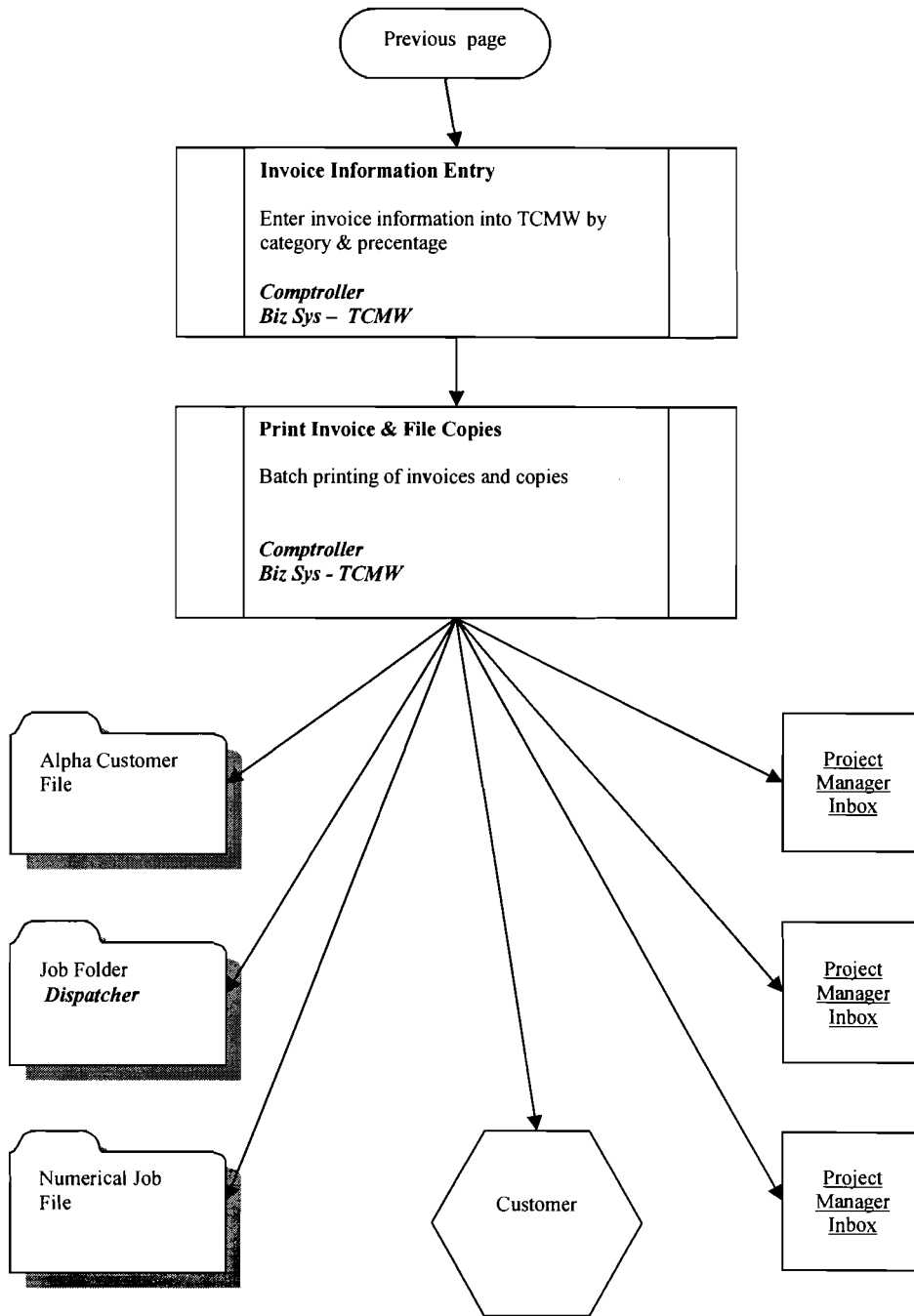
# Project Flow after Bid Acceptance



APPENDIX B – VALUE STREAM MAPS DEVELOPED FOR BALCO SERVICES,  
INCORPORATED

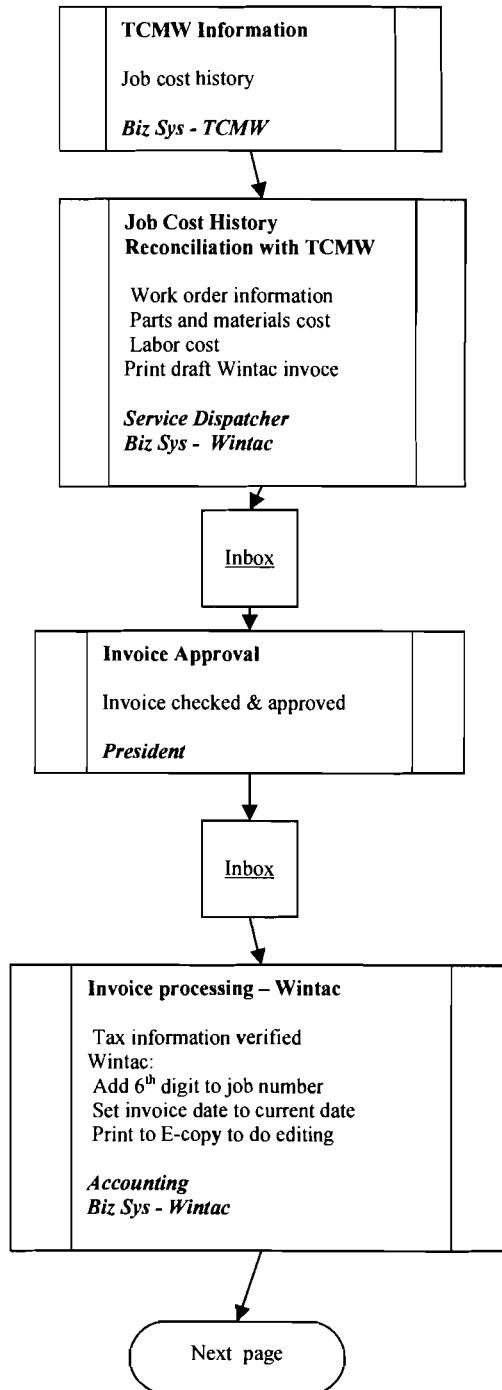
## Balco Invoicing – Project







## Balco Invoicing – Service



Previous page

**Invoice Processing – E-copy**  
Change Wintac invoice number to job number on header  
Add Balco invoice number (from TCMW) to invoice  
Print 5 copies of Balco invoice (colors)  
Mails invoice on Balco letterhead to customer  
  
*Accounting*  
*Biz Sys – E-copy*

Alpha Customer  
File

Job Folder

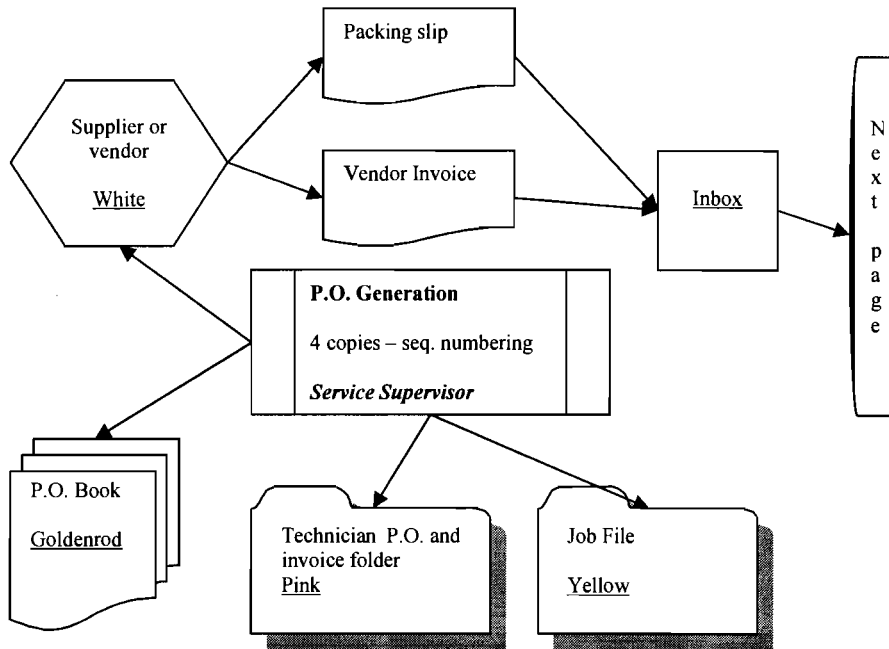
Numerical Job  
File

Customer

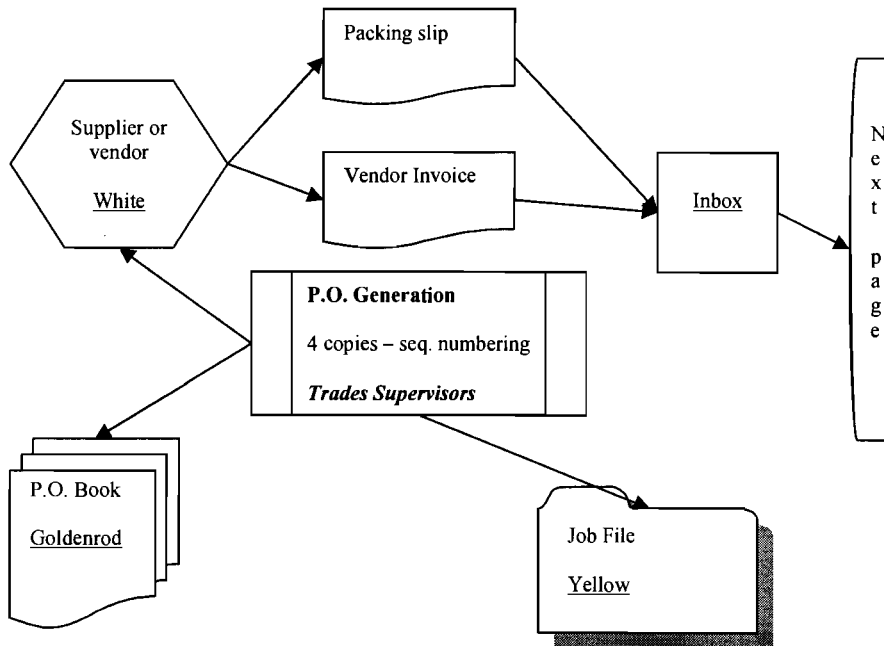
Trades Managers  
Inbox

# P.O. Process – Service and Project

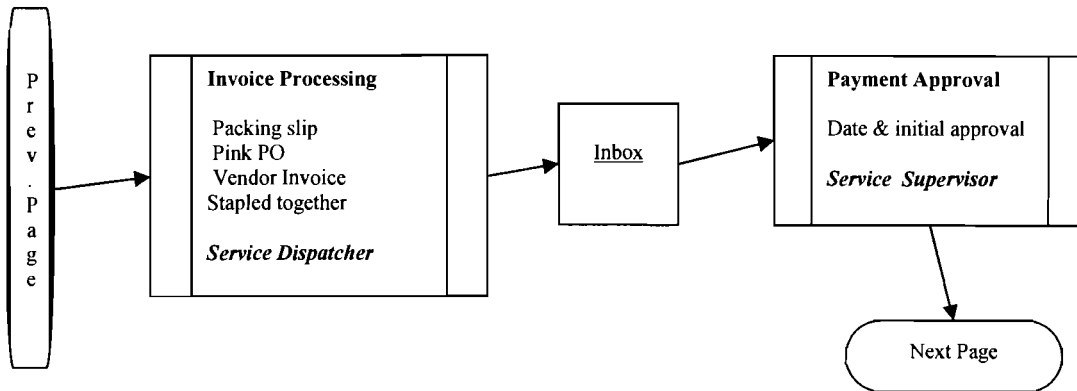
## Service P.O.'s



## Project P.O.'s



### Service P.O.'s



### Project P.O.'s

