

AQS200 – Root Cause
Exercise 5a
Problem Understanding – Flowchart

Name: _____

Date: _____

Instructions:

1. Refer Flowchart Symbols on pages 2-7
2. Create a flowchart using the procedure shown below.







Procedure for Processing Customer Payments

1. Receive customer payment.
2. Pull customer invoice from file.
3. Verify invoice has a purchase order number.
 - a. If invoice does not have a purchase order number, contact Purchaser for information.
4. Pull purchase order and attach to invoice.
5. Verify amounts match.
 - a. If amounts do not match, consult Manager on discrepancy.
 - b. Investigate and rectify discrepancy.
6. Send customer payment, invoice and purchase order to processing.







Exercise 5a

Problem Understanding – Flowchart

COMMON FLOW CHART SYMBOLS




Symbol	Name (alias)	Description
	Process	Show a Process or action step. This is the most common symbol in both process flowcharts and process maps.
	Predefined Process (Subroutine)	<p>A Predefined Process symbol is a marker for another process step or series of process flow steps that are formally defined elsewhere.</p> <p>This shape commonly depicts sub-processes (or subroutines in programming flowcharts). If the sub-process is considered "known" but not actually defined in a process procedure, work instruction, or some other process flowchart or documentation, then it is best not to use this symbol since it implies a formally defined process.</p>
	Alternate Process	As the shape name suggests, this flowchart symbol is used when the process flow step is an alternate to the normal process step. Flow lines into an alternate process flow step are typically dashed.
	Delay	The Delay flowchart symbol depicts any waiting period that is part of a process. Delay shapes are common in process mapping.
	Preparation	As the names states, any process step that is a Preparation process flow step, such as a set-up operation.
	Manual Operation	Manual Operations flowchart shapes show which process steps are not automated. In data processing flowcharts, this data flow shape indicates a looping operation along with a loop limit symbol (which is not supported by Microsoft Office, but a Manual Operation symbol rotated 180° will do the trick.)

Exercise 5a**Problem Understanding – Flowchart****Branching and Control of Flow Symbols**

Symbol	Name (alias)	Description
	Flow Line (Arrow, Connector)	Flow line connectors show the direction that the process flows.
	Terminator (Terminal Point, Oval)	Terminators show the start and stop points in a process. When used as a Start symbol, terminators depict a <i>trigger action</i> that sets the process flow into motion.
	Decision	Indicates a question or branch in the process flow. Typically, a Decision flowchart shape is used when there are 2 options (Yes/No, No/No-Go, etc.)
	Connector (Inspection)	<p>Flowchart: In flowcharts, this symbol is typically small and is used as a Connector to show a jump from one point in the process flow to another. Connectors are usually labeled with capital letters (A, B, AA) to show matching jump points. They are handy for avoiding flow lines that cross other shapes and flow lines. They are also handy for jumping to and from a sub-processes defined in a separate area than the main flowchart.</p> <p>Process Mapping: In process maps, this symbol is full sized and shows an Inspection point in the process flow.</p> <p><i>[Just to confuse things further, some people will use a circle to indicate an operation and a square to indicate an inspection. That's why it's important to include a symbol key in the flowchart.]</i></p>
	Off-Page Connector	Off-Page Connector shows continuation of a process flowchart onto another page. When using them in conjunction with Connectors, it's best to differentiate the labels, e.g. use numbers for Off-Page Connectors and capital letters for Connectors. In actual practice, most flowcharts just use the Connect shape for both on-page and off-page references.
	Merge (Storage)	<p>Flowchart: Shows the merging of multiple processes or information into one.</p> <p>Process Mapping: commonly indicates storage of raw materials.</p>

Exercise 5a








Problem Understanding – Flowchart

Symbol	Name (alias)	Description
	Extract (Measurement)	<p>Flowchart: Shows when a process splits into parallel paths. Also commonly indicates a Measurement, with a capital 'M' inside the symbol.</p> <p>Process Mapping: commonly indicates storage of finished goods.</p>
	Or	<p>The logical Or symbol shows when a process diverges - usually for more than 2 branches. When using this symbol, it is important to label the out-going flow lines to indicate the criteria to follow each branch.</p>
	Summing Junction	<p>The logical Summing Junction flowchart shape is shows when multiple branches converge into a single process. The merge symbol is more common for this use, though. This symbol and the Or symbol are really more relevant in data processing flow diagrams than in process flowcharts.</p>

Exercise 5a

Problem Understanding – Flowchart






Input and Output Symbols

Symbol	Name (alias)	Description
	Data (I/O)	The Data flowchart shape indicates inputs to and outputs from a process. As such, the shape is more often referred to as an I/O shape than a Data shape.
	Document	Pretty self explanatory - the Document flowchart symbol is for a process step that produces a document.
	Multi- Document	Same as Document, except, well, multiple documents. This shape is not as commonly used as the Document flowchart shape, even when multiple documents are implied.
	Display	Indicates a process step where information is displayed to a person (e.g., PC user, machine operator).
	Manual Input	Manual Input flowchart shapes show process steps where the operator/ user is prompted for information that must be manually input into a system.
	Card	This is the companion to the punched tape flowchart shapes. This shape is seldom used.
	Punched Tape	If you're very good at stretching all the life out of a machine, you may still have use for the Punched Tape symbol - used for input into old computers and CNC machines.



Exercise 5a

Problem Understanding – Flowchart

File and Information Storage Symbols

Symbol	Name (alias)	Description
	Stored Data	A general Data Storage flowchart shape used for any process step that stores data (as opposed to the more specific shapes to follow next in this table).
	Magnetic Disk (Database)	The most universally recognizable symbol for a data storage location, this flowchart shape depicts a database.
	Direct Access Storage	Direct Access Storage is a fancy way of saying Hard Drive.
	Internal Storage	Used in programming flowcharts to mean information stored in memory, as opposed to on a file.
	Sequential Access Storage (Magnetic Tape)	Although it looks like a 'Q', the symbol is supposed to look like a reel of tape.

Data Processing Symbols

Symbol	Name (alias)	Description
	Collate	The Collate flowchart shape indicates a process step that requires organizing data, information, or materials according into a standard format or arrangement.
	Sort	Indicates the sorting of data, information, materials into some pre-defined order.

Exercise 5a

Problem Understanding – Flowchart

Caveat: The descriptions given above are written from the perspective of someone using them to create **process flow charts**, whereas many of the flowchart symbols actually have their roots in the data processing diagrams and programming flow charts. So, not all the flowcharting shapes shown below may be relevant to your needs.

The flowchart symbol names in parentheses are common alternates for a given shape. Sometimes a flowchart shape can have more than one meaning, as with the Circle shape, which depicts a jump node in flow charts and inspection point in business process mapping. Other times, there are just multiple names for the same flow chart symbol - such as Terminator and Terminal Point.

The Most Commonly used Flowchart Symbols

The majority of flowcharts rely on just a few of the process-related symbols to do all the heavy lifting: **Terminator**, **Process**, **Decision**, **Document**, and **Connector**. In fact, if you use other flowcharting shapes, many people won't know what they are for, so you may want to add a symbol key to your flowchart.