

How to Do an FMEA: A Step-by-Step Standard Operating Procedure

This procedure explains how to do an FMEA (Failure Mode and Effects Analysis) for a process or design, using a Bank ATM machine as the working example. It walks through preparation, team formation, scope definition, failure identification, risk scoring, and corrective action tracking so that you can complete an FMEA that is accurate, traceable, and audit-ready.

Step-04) Path 3 Development- (Testing and Detection Controls through Detection Ranking)

System		Bank		Potential					FMEA Number		XYZ/2018/10	
Subsystem		ATM Machine		Failure Mode and Effects and Criticality Analysis					Prepared By		ABC	
Component		ATM Machine		(Design FMEA or Process FMEA)					FMEA Date		10-Jan-2018	
Design/ Process Lead		ABC							Revision Date		15-Nov-2018	
Core Team		ABC, DE, FGH, UK							Page		1 of 4	

Process FMEA in Bank ATM system									
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	
					Machine Jam	4	Internal "Machine Jam" alert	9	
					Power Failure during transaction	2	None	10	

HOW WELL THE CONTROLS CAN DETECT EITHER THE CAUSE OR ITS FAILURE MODE		
Detection	Likelihood of DETECTION by Design Control	Ranking
Absolute	Design control cannot detect potential cause/mechanism and subsequent failure mode	10
Uncertainty	Very remote chance the design control will detect potential cause/mechanism and subsequent failure mode	9
Very Remote	Remote chance the design control will detect potential cause/mechanism and subsequent failure mode	8
Remote	Very low chance the design control will detect potential cause/mechanism and subsequent failure mode	7
Very Low	Low chance the design control will detect potential cause/mechanism and subsequent failure mode	6
Low	Moderate chance the design control will detect potential cause/mechanism and subsequent failure mode	5
Moderate	Moderately High chance the design control will detect potential cause/mechanism and subsequent failure mode	4
Moderately High	High chance the design control will detect potential cause/mechanism and subsequent failure mode	3
High	Very high chance the design control will detect potential cause/mechanism and subsequent failure mode	2
Very High	Design control will detect potential cause/mechanism and subsequent failure mode	1
Almost Certain		

FMEA worksheet for the Bank ATM system showing process step, failure mode, effect, severity, classification, potential causes, occurrence, current controls, and detection rankings, with a color-coded detection chart from green to red. Example values: Out of Cash (DET=5), Machine Jam (DET=9), Power Failure during transaction (DET=10).

Scope

Before starting the FMEA, define what the analysis will cover.

- Determine whether the exercise is a Design FMEA or a Process FMEA.
- Decide if the analysis covers a concept, system, design, process, or service.
- Establish the boundaries of the analysis and the level of detail required.

- Use a flowchart to visually communicate the scope so every team member understands it in the same way.

ii) Form and assemble a cross-functional team:



Illustration of a cross-functional team meeting at a table, with labels for Design, Manufacturing, Quality, Testing, Reliability, Maintenance, Purchasing, Sales, Marketing, and Customer Service.

For the worked example used throughout this guide, the FMEA scope is defined as follows:

- System: Bank
- Subsystem: ATM Machine
- Component: ATM Machine

- Analysis type: Process FMEA

Step-06) Actions Taken / Design Review:

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)									FMEA Number	XYZ/2018/10
Subsystem	ATM Machine										Prepared By	ABC
Component	ATM Machine										FMEA Date	10-Jan-2018
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Process FMEA in Bank ATM system														
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	RPN	CRIT	Actions recommended	Responsibility	Target Date	Actions taken
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	240	48	Develop tracking system to ensure cash is available at all the time	ABC	12-Dec	Implemented tracking system for "availability" reocr
					Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec	
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan	

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FMEA table for the ATM system showing actions taken, recommended actions, RPN values, and responsibilities.

Team & References

Assemble the cross-functional team and gather reference documents before you begin scoring failures.

Preparatory documents to collect or create:

- Root cause analysis of past failures (investigate previous issues before starting).
- Boundary/block diagram and parameter diagram, for Design FMEA.
- Process flow diagram and characteristics matrix, for Process FMEA.

- Ensure these documents are available from the beginning of the development phase.

ii) Form and assemble a cross-functional team:



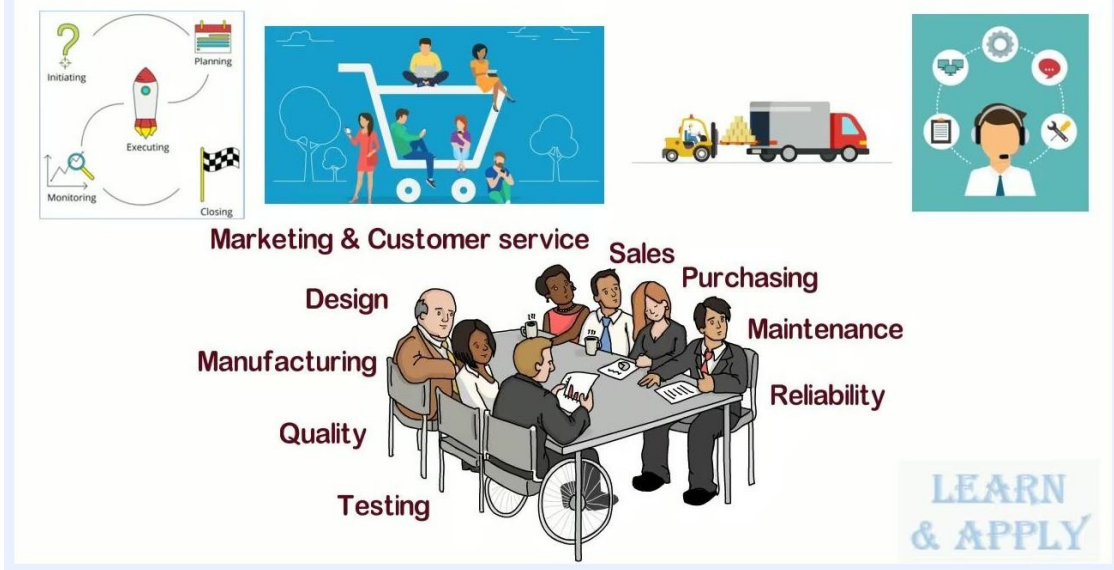
A sample flowchart labeled "Sample Flowchart" with steps and decision points, annotated "SCOPE" and listing System, Design, Process, and Service. The slide also notes boundaries and level of detail.

Cross-functional team composition:

- Design
- Manufacturing
- Quality
- Testing
- Reliability
- Maintenance
- Purchasing
- Sales
- Marketing

- Customer Service

ii) Form and assemble a cross-functional team:



A hand writing "Step-01) Preparation for FMEA: i) Collect and create key documents" on a whiteboard, listing investigation of past failures, root cause analysis, boundary/block diagram, parameter diagram, process flow diagram, and characteristics matrix, with Design FMEA and Process FMEA highlighted.

Document identifiers for the worked example:

- Design/Process Lead: ABC
- Core Team: ABC, DE, FGH, JK
- FMEA Number: XYZ/2018/10
- Prepared By: ABC
- FMEA Date: 10-Jan-2018
- Revision Date: 15-Nov-2018

- Page: 1 of 4

System		Potential Failure Mode and Effects and Criticality Analysis (Design FMEA or Process FMEA)	FMEA Number	
Subsystem			Prepared By	
Component			FMEA Date	
Design/Process Lead			Revision Date	
Core Team			Page	

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design FMEA or Process FMEA)	FMEA Number	XYZ/2018/10
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Let's say, we need to conduct process FMEA for ATM machine

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Blank and example-filled FMEA form headers showing System: Bank, Subsystem: ATM Machine, Component: ATM Machine, and a note stating that the team needs to conduct a process FMEA for the ATM machine.

Additional reference material:

- ASQ (American Society for Quality) Certified Six Sigma Black Belt resources.

- Quality-One International guidance material on FMEA methodology.

Step-07) Re-Ranking RPN and Closure:

System	Bank	Potential Failure Mode and Effects and Criticality Analysis										FMEA Number		XYZ/2018/10	
Subsystem	ATM Machine	(Design-FMEA or Process FMEA)										Prepared By		ABC	
Component	ATM Machine											FMEA Date		10-Jan-2018	
Design/ Process Lead	ABC											Revision Date		15-Nov-2018	
Core Team	ABC, DE, FGH, IJK											Page		1 of 4	

Process FMEA in Bank ATM system

Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	RPN	CRIT	Actions recommended	Responsibility	Target Date	Actions taken	SEV	OCC	DET	RPN
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	240	48	Develop tracking system to ensure cash is available at all the time	ABC	12-Dec	implemented tracking system for "Cash available" to avoid recurrence	8	2	2	32
					Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec	Created preventive maintenance plan for ATM machine and displayed a lamp to indicate "Machine is jam" if occurred	6	2	3	48
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan	Implementation of UPS system is costly, not considered at this point of time	8	2	10	160

CONFIRMED RELATIVE IMPROVEMENT

Screen listing reference sources, including ASQ Certified Six Sigma Black Belt and Quality-One International, as additional resources for FMEA methodology.

Process Steps

Once the form header is complete, populate the first columns using the pre-work documents (block diagrams, process flow diagrams, characteristics matrix).

1. Write each process step or function in a verb-noun format (e.g., "Dispense cash") with a measurable outcome. Functions may originate from customer wants/needs/desires translated into requirements, design specifications, government regulations, program-specific requirements, product characteristics, or desired process outputs.

Step-02) Path-1 development (Process function through Severity ranking):

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)	FMEA Number	XYZ/2018/10
Subsystem	ATM Machine		Prepared By	ABC
Component	ATM Machine		FMEA Date	10-Jan-2018
Design/Process Lead	ABC		Revision Date	15-Nov-2018
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Process FMEA in Bank ATM system

Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8

VERB-NOUN CONTEXT

- Wants, needs and desires translated
- Specifications of a design
- Government regulations
- Program-specific requirements
- Characteristics of product to be analyzed
- Desired process output

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FMEA form with the first row filled in: Process Step/Function "Dispense amount of cash requested by customer," annotated to highlight the verb-noun format and its link to requirements.

2. Define potential failure modes as "anti-requirements." A failure mode can take one of five forms:
 - Full function failure
 - Partial or degraded function failure
 - Intermittent function failure
 - Over function failure

- Unintended function failure

Step-02) Path-1 development (Process function through Severity ranking):

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Process FMEA in Bank ATM system

Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8

SEVERITY NUMBER TO EACH EFFECT

Effect	SEVERITY of Effect	Ranking
Hazardous without warning	Very high severity ranking when a potential failure mode affects safe system operation without warning	10
Hazardous with warning	Very high severity ranking when a potential failure mode affects safe system operation with warning	9
Very High	System inoperable with destructive failure without compromising safety	8
High	System inoperable with equipment damage	7
Moderate	System inoperable with minor damage	6
Low	System inoperable without damage	5
Very Low	System operable with significant degradation of performance	4
Minor	System operable with some degradation of performance	3
Very Minor	System operable with minimal interference	2
None	No effect	1

Very High Effect

No Effect

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FMEA form with an arrow pointing to the "Potential Effect of Failure" column, labeled as the result if the failure occurs.

- For the example process step "Dispense amount of cash requested by customer," list the possible failure modes:
 - Does not dispense cash
 - Dispenses less cash

- Takes too long to dispense cash

Step-02) Path-1 development (Process function through Severity ranking):

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Process FMEA in Bank ATM system

Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV
Dispense amount of cash requested by customer 	Does not dispense cash 	Customer very dissatisfied	8

PROCESS FUNCTION 

- Does not dispense cash
- Dispense less cash
- Takes too long to dis



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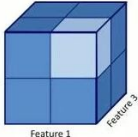
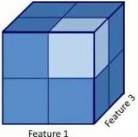
FMEA form showing the process function with multiple failure modes written beneath it: does not dispense cash, dispenses less cash, and takes too long to dispense cash.

Carry one failure mode at a time (e.g., "Does not dispense cash") through the remaining columns for clarity.

- Classify whether the process step or failure mode involves a critical or special characteristic. A critical characteristic is a feature or dimension where reasonably anticipated variation could directly affect compliance with government regulations or the safe operation of the equipment. A special characteristic is a feature or dimension where reasonably anticipated variation could affect principal fit, function, durability, customer satisfaction, or manufacturing process capability.

Step-02) Path-1 development (Process function through Severity ranking):

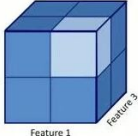
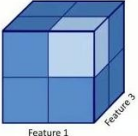
System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)		FMEA Number	XYZ/2018/10
Subsystem	ATM Machine			Prepared By	ABC
Component	ATM Machine			FMEA Date	10-Jan-2018
Design/Process Lead	ABC			Revision Date	15-Nov-2018
Core Team	ABC, DE, FGH, UK			Page	1 of 4

Process FMEA in Bank ATM system					
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	CRITICAL CHARACTERISTICS  • Compliance with Government regulations • Safe operation of the equipment SPECIAL CHARACTERISTICS  • Principal fit, function, durability • Customer satisfaction

FMEA worksheet split into a "Critical Characteristics" section and a "Special Characteristics" section, each illustrated with a labeled cube and its defining bullet points.

Step-02) Path-1 development (Process function through Severity ranking):

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)		FMEA Number	XYZ/2018/10
Subsystem	ATM Machine			Prepared By	ABC
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Process FMEA in Bank ATM system					
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	CRITICAL CHARACTERISTICS  • Compliance with Government regulations • Safe operation of the equipment SPECIAL CHARACTERISTICS  • Principal fit, function, durability • Customer satisfaction

FMEA worksheet showing the process step, failure mode, effect, severity, and classification columns, with an arrow pointing to the "Critical Characteristics" designation.

Failure Analysis

Document the effect, severity, cause, occurrence, current controls, and detection rating for each failure mode.

Step: Define the potential effect of failure

Describe the result if the failure mode occurs. For "Does not dispense cash," the effect is "Customer very dissatisfied."

Step: Assign a severity number (1–10 scale)

- 10 – Hazardous without warning (affects safety, no warning)
- 9 – Hazardous with warning (affects safety, with warning)
- 8 – Very high (system inoperable, destructive failure, no safety compromise)
- 7 – High (system inoperable, equipment damage)
- 6 – Moderate (system inoperable, minor damage)
- 5 – Low (system inoperable, no damage)
- 4 – Very low (system operable, significant performance degradation)
- 3 – Minor (system operable, some performance degradation)
- 2 – Very minor (system operable, minimal interference)

- 1 – None (no effect)

Step-02) Path-1 development (Process function through Severity ranking):

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)	FMEA Number	XYZ/2018/10
Subsystem	ATM Machine		Prepared By	ABC
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Process FMEA in Bank ATM system

Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8

SEVERITY NUMBER TO EACH EFFECT

Effect	SEVERITY of Effect	Ranking
Hazardous without warning	Very high severity ranking when a potential failure mode affects safe system operation without warning	10
Hazardous with warning	Very high severity ranking when a potential failure mode affects safe system operation with warning	9
Very High	System inoperable with destructive failure without compromising safety	8
High	System inoperable with equipment damage	7
Moderate	System inoperable with minor damage	6
Low	System inoperable without damage	5
Very Low	System operable with significant degradation of performance	4
Minor	System operable with some degradation of performance	3
Very Minor	System operable with minimal interference	2
None	No effect	1

Very High Effect

No Effect

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FMEA form displaying the severity ranking scale, color-coded from red (10) to green (1), with the column for assigning a severity number to each effect highlighted.

"Customer very dissatisfied" is scored SEV = 8.

If any severity score reaches 9 or 10, flag it for immediate recommended action, particularly where the effect touches product/process design, safety, or regulatory compliance.

Step-02) Path-1 development (Process function through Severity ranking):

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design FMEA or Process FMEA)	FMEA Number	XYZ/2018/10
Subsystem	ATM Machine		Prepared By	ABC
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Process FMEA in Bank ATM system

Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8

RESULTS OF FAILURE
9 OR 10

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FMEA form with the severity ranking highlighted and results of failure scored 9 or 10 marked in red and green, alongside icons representing safety and regulatory concerns.

Step: Complete the row and classify the characteristic

Process Step/ Function	Potential Failure Mode	Potential Effect of Failure	SEV	Classification
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S / R / K / blank, per your organization's guideline

Step-02) Path-1 development (Process function through Severity ranking):

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Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8

VERB-NOUN CONTEXT

- Wants, needs and desires translated
- Specifications of a design
- Government regulations
- Program-specific requirements
- Characteristics of product to be analyzed
- Desired process output

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FMEA form listing the five anti-requirement categories: full function failure, partial/degraded function failure, intermittent function failure, over function failure, and unintended function failure.

Mark the classification column using your organization's notation (for example, S for Safety, R for Regulatory, K for Key characteristic, or leave it blank if not applicable).

Step: List potential causes and occurrence ranking

For the failure mode "Does not dispense cash," list every potential cause linked to the effect "Customer very dissatisfied":

Potential Cause	Occurrence (OCC)	Interpretation
Out of Cash	6	Moderate, occasional failures (approx. 1 in 80)
Machine Jam	4	Low, relatively few failures (approx. 1 in 2,000)
Power Failure during transaction	2	Remote, failure is unlikely (approx. 1 in 150,000)

Step-03) Path-2 Development- (Potential Causes and Prevention Controls through Occurrence Ranking)

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)			FMEA Number	XYZ/2018/10
Subsystem	ATM Machine				Prepared By	ABC
Component	ATM Machine				FMEA Date	10-Jan-2018
Design/ Process Lead	ABC				Revision Date	15-Nov-2018
Core Team	ABC, DE, FGH, UK				Page	1 of 4

Process FMEA in Bank ATM system						
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6
					Machine Jam	4
					Power Failure during transaction	2

QUANTIFYING PROBABILITY OF FAILURE		
PROBABILITY of Failure	Failure Prob	Ranking
Very High: Failure is almost inevitable	>1 in 2	10
	1 in 3	9
High: Repeated failures	1 in 8	8
	1 in 20	7
Moderate: Occasional failures	1 in 80	6
	1 in 400	5
	1 in 2,000	4
Low: Relatively few failures	1 in 10,000	3
	1 in 100,000	2
Remote: Failure is unlikely	<1 in 1,000,000	1

FMEA worksheet with a probability-of-failure chart showing occurrence rankings for each cause, color-coded by risk level (red, yellow, green).

Step: Document current controls and detection rating

Current controls are the mechanisms, tests, or procedures in place to detect the cause before it reaches the customer. Detection (DET) is scored on a 1–10 scale, where 1 means the control is almost certain to detect the failure and 10 means the control is unable to detect it at all.

Potential Cause	Current Controls	DET
Out of Cash	Internal "Low Cash" alert	5 (moderate chance of detection)
Machine Jam	Internal "Machine Jam" alert	9 (very remote chance of detection)
Power Failure during transaction	None	10 (no control exists)

Interpret the detection scale as follows: rankings 1–3 indicate high to almost certain detection (green), 4–6 indicate moderate detection (yellow), and 7–10 indicate low to no detection (red).

Step-02) Path-1 development (Process function through Severity ranking):

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Process FMEA in Bank ATM system

Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV
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SEVERITY NUMBER TO EACH EFFECT

Effect	SEVERITY of Effect	Ranking
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Low	System inoperable without damage	5
Very Low	System operable with significant degradation of performance	4
Minor	System operable with some degradation of performance	3
Very Minor	System operable with minimal interference	2
None	No effect	1

Very High Effect (Ranking 10-8)
No Effect (Ranking 1-2)

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FMEA form showing the completed row for "Dispense amount of cash requested by customer," scored at severity 8, with the classification column highlighted alongside the color-coded severity ranking table.

Risk Priority

Calculate the Risk Priority Number (RPN) and Criticality for each cause using:

- RPN = Severity (S) × Occurrence (O) × Detection (D)
- Criticality = Severity (S) × Occurrence (O)

Potential Cause	S	O	D	RPN	Criticality
Out of Cash	8	6	5	240	48
Machine Jam	8	4	9	288	32
Power Failure during transaction	8	2	10	160	16

Step-03) Path-2 Development- (Potential Causes and Prevention Controls through Occurrence Ranking)

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)	FMEA Number	XYZ/2018/10
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Process FMEA in Bank ATM system

Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6
					Machine Jam	4
					Power Failure during transaction	2

ALL POTENTIAL CAUSES FOR AN EFFECT

FMEA worksheet with arrows and highlights connecting "Customer very dissatisfied" to all three potential causes.

Use RPN and Criticality to rank potential failures: higher values indicate higher risk and higher priority for corrective action.

Many organizations use an RPN threshold to determine which failure modes require corrective action. Compare each calculated RPN against the threshold to flag high-risk items, and be aware that focusing only on lowering RPN scores can lead to adjusting rankings rather than addressing the underlying risk.

Step-05) Action Priority & Assignment:

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)	FMEA Number	XYZ/2018/10
Subsystem	ATM Machine		Prepared By	ABC
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Process FMEA in Bank ATM system

Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	RPN	CRIT	Actions recommended	Responsibility	Target Date
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	240	48	Develop tracking system to ensure cash is available at all the time	ABC	12-Dec
					Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan

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FMEA worksheet annotated with an "RPN threshold" arrow pointing to "Failure Mode Risk" and a checkmark, indicating the threshold's role in flagging risk.

Reference the RPN matrix to classify risk zones by severity and occurrence:

- Red Zone: "Must eliminate the risk" (high severity and/or occurrence).
- Yellow Zone: "Consideration" (medium risk, needs attention).

- Green Zone: "Acceptable risk" (low severity and occurrence).

Step-06) Actions Taken / Design Review:

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design FMEA or Process FMEA)									FMEA Number	XYZ/2018/10
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Component	ATM Machine										FMEA Date	10-Jan-2018
Design/ Process Lead	ABC										Revision Date	15-Nov-2018
Core Team	ABC, DE, FGH, UK										Page	1 of 4

Process FMEA in Bank ATM system														
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	RPN	CRIT	Actions recommended	Responsibility	Target Date	Actions taken
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	240	48	Develop tracking system to ensure cash is available at all the time	ABC	12-Dec	Implemented tracking system for "available" reocr
					Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec	
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan	

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RPN threshold matrix with zones for "Must Eliminate the Risk" and "Acceptable Risk," axes for Severity and Occurrence, and a legend for Acceptable, Consideration, and Need Corrective Action.

Use the FMEA process for continuous improvement by focusing corrective action on the Top 5 RPN values first.

Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec	
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan	



FMEA worksheet showing potential causes, occurrence rankings, and the RPN threshold with a danger gauge pointing to "Failure Mode Risk." Example causes: Out of cash (O=6), Machine jam (O=4), Power failure during transaction (O=2).

Recommended Actions

For each cause above the risk threshold, document the recommended action, the responsible owner, and the target completion date.

Potential Cause	Action Recommended	Responsible	Target Date
Out of Cash	Develop a tracking system to ensure cash is available at all times	ABC	12-Dec
Machine Jam	Plan and execute regular preventive maintenance of the machine	DEF	23-Dec
Power Failure during transaction	Study and implement the feasibility of installing a UPS	XYZ	02-Jan

Step-03) Path-2 Development- (Potential Causes and Prevention Controls through Occurrence Ranking)

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)				FMEA Number	XYZ/2018/10
Subsystem	ATM Machine					Prepared By	ABC
Component	ATM Machine					FMEA Date	10-Jan-2018
Design/ Process Lead	ABC					Revision Date	15-Nov-2018
Core Team	ABC, DE, FGH, UK				Page	1 of 4	
Process FMEA in Bank ATM system							
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	
					Machine Jam	4	
					Power Failure during transaction	2	

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FMEA worksheet listing the process step, failure mode, effect, severity, classification, and potential causes with their occurrence ratings: Out of Cash (6), Machine Jam (4), Power Failure during transaction (2).

Step-05) Action Priority & Assignment:

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)									FMEA Number	XYZ/2018/10
Subsystem	ATM Machine										Prepared By	ABC
Component	ATM Machine										FMEA Date	10-Jan-2018
Design/ Process Lead	ABC										Revision Date	15-Nov-2018
Core Team	ABC, DE, FGH, UK										Page	1 of 4

Process FMEA in Bank ATM system													
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	RPN	CRIT	Actions recommended	Responsibility	Target Date
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	240	48	Develop tracking system to ensure cash is available at all the time	 ABC	 12-Dec
					Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan

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FMEA worksheet listing recommended actions, responsible persons, and target dates for each failure cause: Out of Cash (Develop tracking system, ABC, 12-Dec), Machine Jam (Preventive maintenance, DEF, 23-Dec), Power Failure (UPS feasibility, XYZ, 02-Jan).

Record what was actually implemented, and close the action only once the countermeasure is proven effective. An FMEA that does not identify or mitigate risk is considered non-value-added.

Potential Cause	Action Taken
Out of Cash	Implemented tracking system for cash
Machine Jam	Created preventive maintenance plan and added an indicator lamp for jams
Power Failure during transaction	UPS not implemented, due to cost

After the actions are in place, re-score Severity, Occurrence, and Detection, then recalculate RPN to confirm relative improvement:

Potential Cause	SEV	OCC	DET	New RPN	Initial RPN
Out of Cash	8	2	2	32	240
Machine Jam	8	2	3	48	288
Power Failure during transaction	8	2	10	160 (no action taken due to cost)	160

Step-05) Action Priority & Assignment:

System	Bank	Potential Failure Mode and Effects and Criticality Analysis									FMEA Number	XYZ/2018/10	
Subsystem	ATM Machine	(Design-FMEA or Process FMEA)									Prepared By	ABC	
Component	ATM Machine										FMEA Date	10-Jan-2018	
Design/ Process Lead	ABC										Revision Date	15-Nov-2018	
Core Team	ABC, DE, FGH, UK										Page	1 of 4	
Process FMEA in Bank ATM system													
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	RPN	CRIT	Actions recommended	Responsibility	Target Date
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	240	48	Develop tracking system to ensure cash is available at all the time	ABC	12-Dec
					Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan

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FMEA worksheet showing RPN and Criticality calculations for each failure cause, with RPN as $S \times O \times D$ and Criticality as $S \times O$. Example values: Out of Cash (RPN=240, CRIT=48), Machine Jam (RPN=288, CRIT=32), Power Failure during transaction (RPN=160, CRIT=16).

Repeat the action-and-re-rank cycle until all risks are reduced to an acceptable level, comparing initial and revised RPN values each time to confirm continuous improvement.

Step-07) Re-Ranking RPN and Closure:

System		Bank		Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)										FMEA Number		XYZ/2018/10	
Subsystem		ATM Machine												Prepared By		ABC	
Component		ATM Machine												FMEA Date		10-Jan-2018	
Design/ Process Lead		ABC												Revision Date		15-Nov-2018	
Core Team		ABC, DE, FGH, IJK												Page		1 of 4	

Process FMEA in Bank ATM system																		
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	RPN	CRIT	Actions recommended	Responsibility	Target Date	Actions taken	SEV	OCC	DET	RPN
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	240	48	Develop tracking system to ensure cash is available at all the time	ABC	12-Dec	Implemented tracking system for "Cash available" to avoid recurrence	8	2	2	32
					Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec	Created preventive maintenance plan for ATM machine and displayed a lamp to indicate "Machine is jam" if occurred	6	2	3	48
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan	Implementation of UPS system is costly, not considered at this point of time	6	2	10	160



CONFIRMED RELATIVE IMPROVEMENT



FMEA table with columns for re-ranked SEV, OCC, DET, and new RPN, showing confirmation of relative improvement with green downward arrows and annotation.

Step-07) Re-Ranking RPN and Closure:

System	Bank	Potential Failure Mode and Effects and Criticality Analysis (Design-FMEA or Process FMEA)										FMEA Number	XYZ/2018/10					
Subsystem	ATM Machine											Prepared By	ABC					
Component	ATM Machine											FMEA Date	10-Jan-2018					
Design/ Process Lead	ABC											Revision Date	15-Nov-2018					
Core Team	ABC, DE, FGH, IJK	Page	1 of 4															
Process FMEA in Bank ATM system																		
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	RPN	CRIT	Actions recommended	Responsibility	Target Date	Actions taken	SEV	OCC	DET	RPN
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	240	48	Develop tracking system to ensure cash is available at all the time	ABC	12-Dec	Implemented tracking system for "Cash available" to avoid recurrence	8	2	2	32
					Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec	Created preventive maintenance plan for ATM machine and displayed a lamp to indicate "Machine is jam" if occurred	6	2	3	48
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan	Implementation of UPS system is costly, not considered at this point of time	6	2	10	160

CONFIRMED RELATIVE IMPROVEMENT

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FMEA table showing initial and revised SEV, OCC, DET, and RPN values, actions taken, and confirmation of relative improvement, marked "Confirmed Relative Improvement."

Control Updates

After actions are confirmed effective, update the corresponding control plan, work instruction, or inspection item to reflect the new controls (for example, the "Low Cash" and "Machine Jam" alerts and the preventive maintenance plan) so that the improved detection and occurrence levels are sustained in production.

Remember: the purpose of an FMEA is to discover and mitigate risk. Use it as a proactive tool to improve safety, reliability, and continuous improvement across your process or design.

Step-06) Actions Taken / Design Review:

System	Bank	Potential Failure Mode and Effects and Criticality Analysis										FMEA Number	XYZ/2018/10	
Subsystem	ATM Machine	(Design-FMEA or Process FMEA)										Prepared By	ABC	
Component	ATM Machine											FMEA Date	10-Jan-2018	
Design/ Process Lead	ABC											Revision Date	15-Nov-2018	
Core Team	ABC, DE, FGH, UK											Page	1 of 4	
Process FMEA in Bank ATM system														
Process Step / Function	Potential Failure Mode	Potential Effect of Failure	SEV	Class	Potential causes	OCC	Current controls	DET	RPN	CRIT	Actions recommended	Responsibility	Target Date	Actions taken
Dispense amount of cash requested by customer	Does not dispense cash	Customer very dissatisfied	8	S	Out of Cash	6	Internal "Low Cash" alert	5	240	48	Develop tracking system to ensure cash is available at all the time	ABC	12-Dec	Implemented tracking system for "available" reocr
					Machine Jam	4	Internal "Machine Jam" alert	9	288	32	Plan and Execute regular preventive maintenance of machine	DEF	23-Dec	
					Power Failure during transaction	2	None	10	160	16	To study and implement feasibility for installation of UPS	XYZ	02-Jan	
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RPN threshold matrix with a "Top 5 RPN" chart emphasizing continuous improvement and corrective action on the highest risks.

FOR REFERENCES,



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Screen with icons for Like, Share, Subscribe, Notification Bell, and "THANK YOU..." message

THANK YOU.....

The purpose of a FMEA is to discover and mitigate risk

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Screen with "THANK YOU....." and the statement "The purpose of a FMEA is to discover and mitigate risk"