

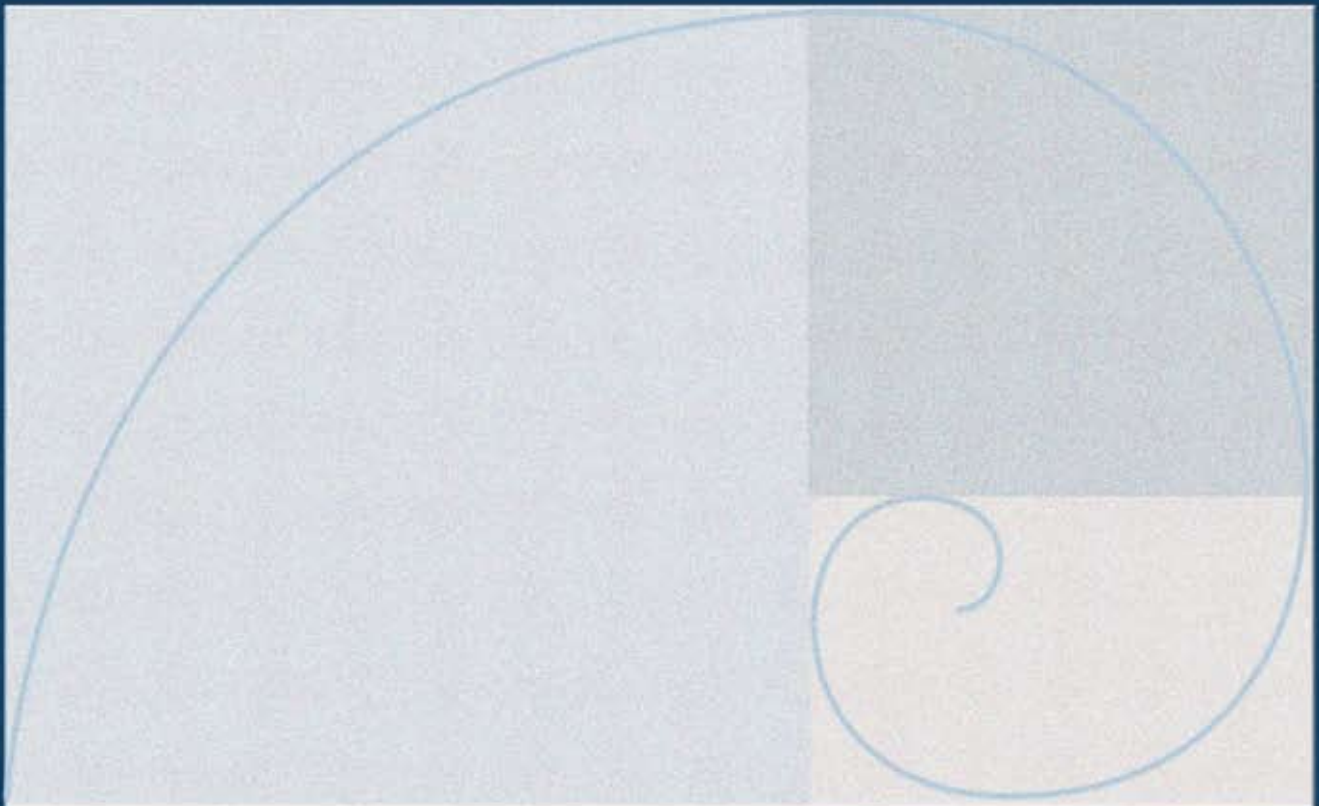


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Six Sigma Tools, Techniques, and Resources



Some Six Sigma Tools, Techniques, and Resources

The following pages provide some common tools and techniques for conducting Six Sigma projects. Summaries of many more techniques are available in George, Michael L., *et al.* *The Lean Six Sigma Pocket Toolbook*. New York: McGraw-Hill, 2005. Also recommended are

Gygi, Craig, *et al.* *Six Sigma for Dummies*. Hoboken, NJ: Wiley, 2005.

Gygi, Craig, *et al.* *Six Sigma Workbook for Dummies*. Hoboken, NJ: Wiley, 2006.

Brue, Greg, and Rod Howes. *Six Sigma: The McGraw-Hill 36-Hour Course*. New York: McGraw-Hill, 2006.

Pyzdek, Thomas. *The Six Sigma Project Planner: a Step-by-Step Guide to Leading a Six Sigma Project Through DMAIC*. New York: McGraw-Hill, 2003.

Pyzdek, Thomas. *The Six Sigma Handbook: A Complete Guide for Green Belts, Black Belts, and Managers at All Levels. Rev. ed.* New York: McGraw-Hill, 2003. [This is the definitive, indispensable handbook to Six Sigma.]

Levine, David M. *Statistics for Six Sigma Green Belts, with Minitab and JMP*. Upper Saddle River, NJ: Prentice Hall, 2006.

The current average industry runs at four sigma, which corresponds to 6210 defects per million opportunities. Depending on the exact definition of “defect” in payroll processing, for example, this sigma level could be interpreted as 6 out of every 1000 paychecks having an error. As “four sigma” is the average current performance, there are industry sectors running above and below this value. Internal Revenue Service (IRS) phone-in tax advice, for instance, runs at roughly two sigma, which corresponds to 308,537 errors per million opportunities. Again, depending on the exact definition of defect, this could be interpreted as 30 out of 100 phone calls resulting in erroneous tax advice. (“Two Sigma” performance is where many noncompetitive companies run.) On the other extreme, domestic (U.S.) airline flight fatality rates run at better than six sigma, which could be interpreted as fewer than 3.4 fatalities per million passengers - that is, fewer than 0.00034 fatalities per 100 passengers.

Source: Carnegie Mellon Software Engineering Institute, 2001. http://www.sei.cmu.edu/str/descriptions/sigma6_body.html

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6σ Project Charter

Project Plan Attached



Business Case

Problem

Goal

Est. Gate Dates

Define

Measure

Analyze

Improve

Control

Project Team

SME's



Three Voices Scorecard

Process Requiring Improvement	Voice of the Customer (VOC) Impact	Voice of the Process (VOP) Impact	Voice of the Business (VOB) Impact	Overall Ranking
	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	
	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	
	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	
	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	
	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	
	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	
	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	
	① ② ③ ④ ⑤	① ② ③ ④ ⑤	① ② ③ ④ ⑤	

1 = very little impact; 2 = little impact; 3 = moderate impact; 4 = high or significant impact; 5 = very high or significant impact

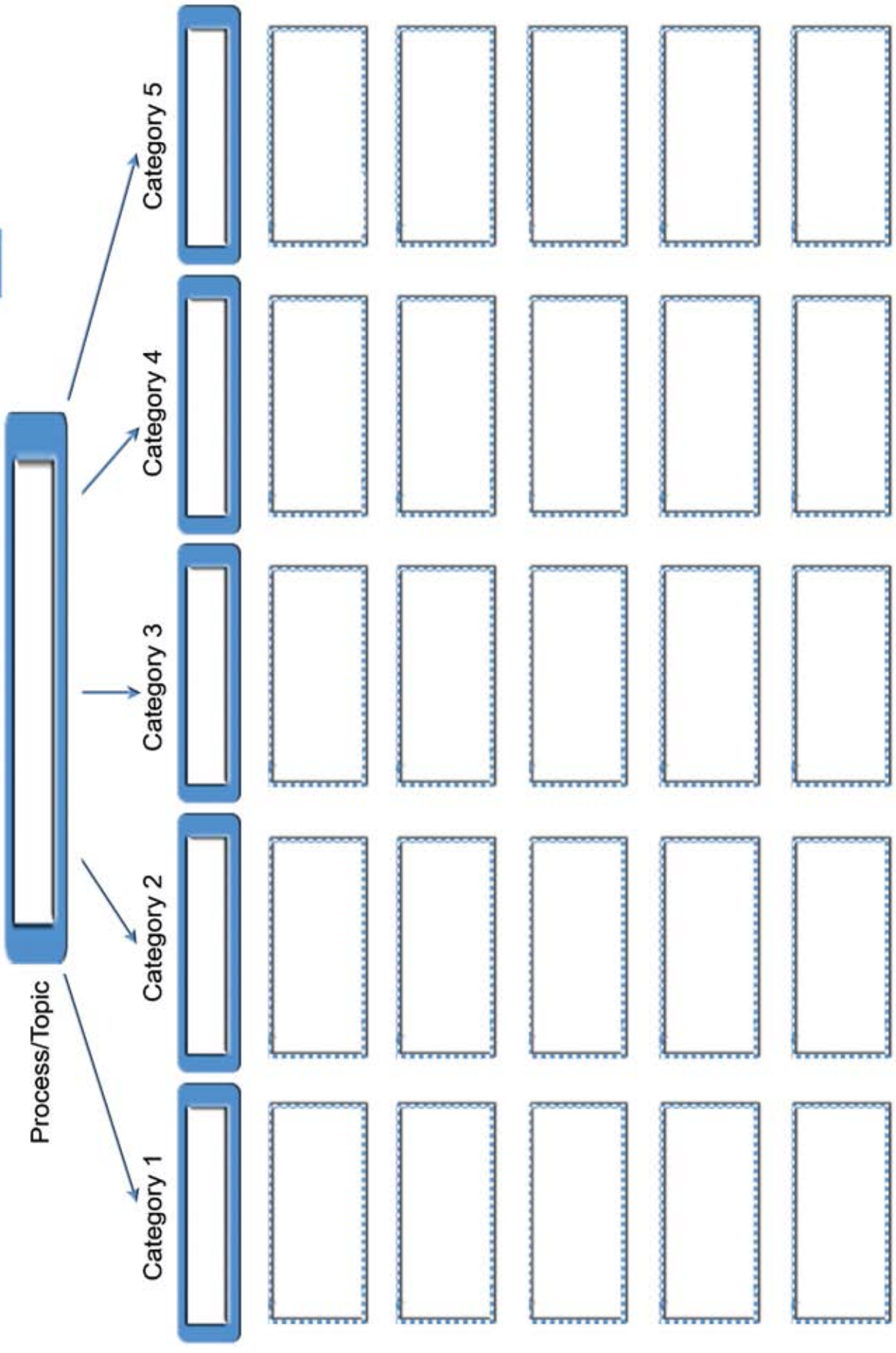
Scoring: $VOC \times VOP \times VOB = \text{Overall Ranking}$

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Date



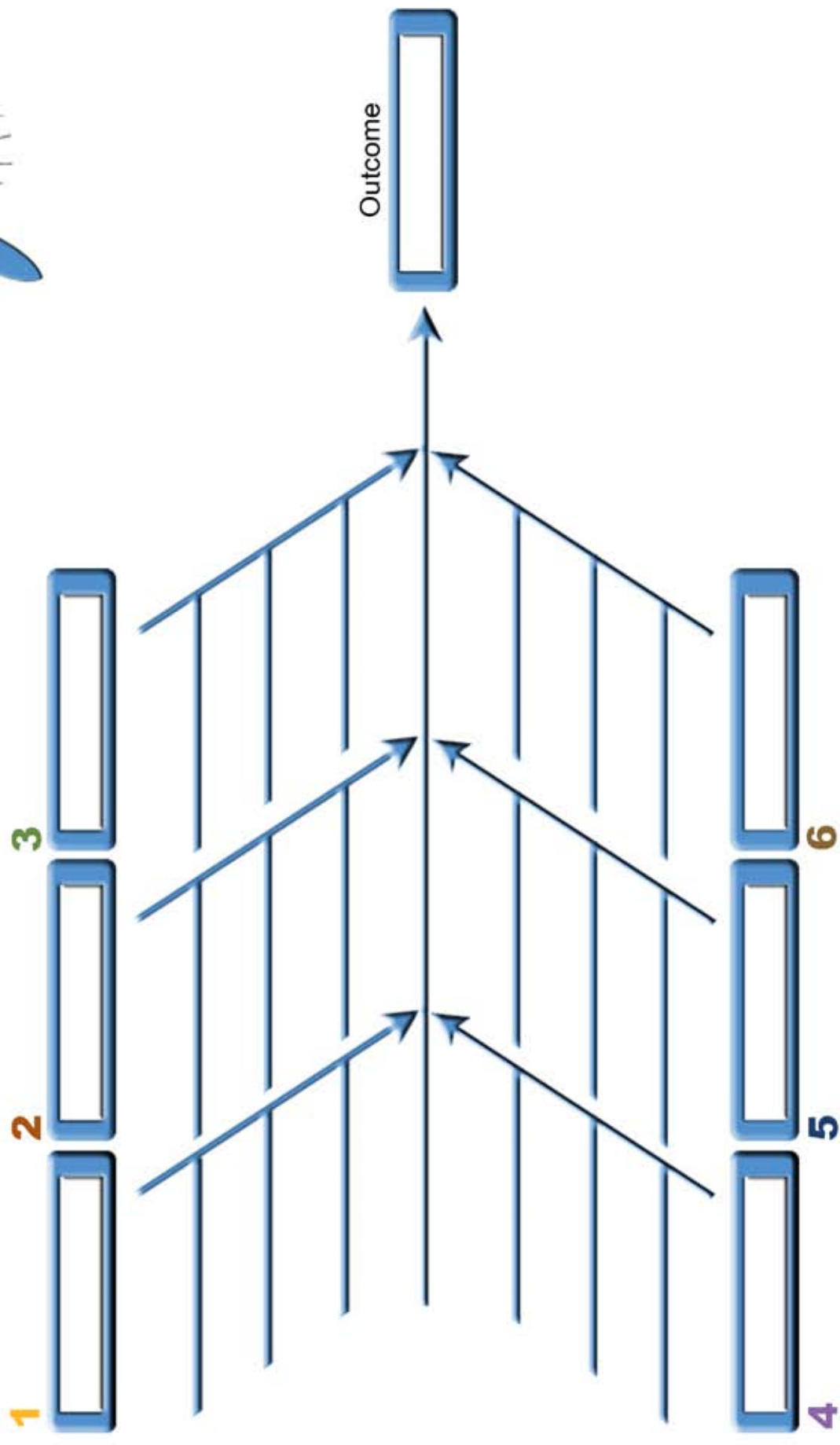
CTX Categorization Exercise: Affinity Diagram



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CT_X Root Cause Analysis: Ishikawa (Fishbone) Diagram

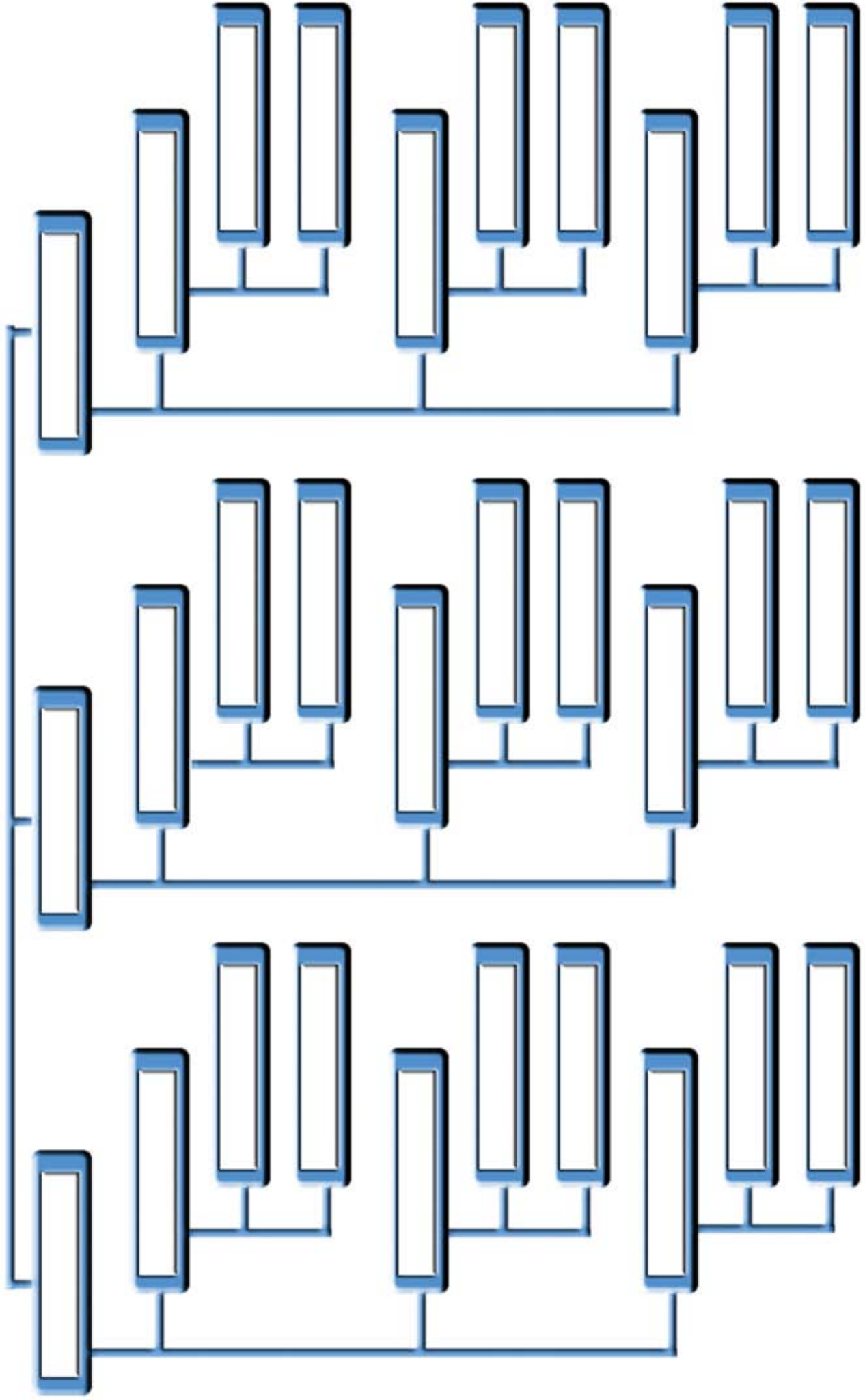


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CT_X Analysis: CT Tree

Critical to _____





SIPOC Diagram

Suppliers	Inputs	Process	Outputs	Customers	Requirements
		Step 1			
		Step 2			
		Step 3			
		Step 4			
		Step 5			
		Step 6			
		Step 7			
		Step 8			
		Step 9			

Process Flow Chart Attached

C&E Matrix Attached

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Cause-and-Effect Analysis: C&E Matrix



Outputs (VOC)

		Outputs (VOC)						Sum (Rank Order)
Inputs	Customer Ranking							

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Process Name

Failure Modes Effects Analysis: FMEA

Step in Process	Potential Failure Mode	Potential Failure Effects	Severity	Potential Causes	Occurrence	Curent Controls	Detection	RPN

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Process Flow Chart Attached

