

SIPOC - Practical Use & Construction Tips

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Presentation Topics

- SIPOC Breakdown
- Construction and Tips
- Ranking Options
- SIPOC uses and Purpose
- SIPOC outputs -
- SIPOC Examples / Details

SIPOC – Definition

- High Level Flow Chart which identifies:
- Key **S**uppliers to Inputs of a process
- Key **I**ntputs to a process
- The **P**rocess - transformation of the inputs – the action steps
- **O**utputs of the transformation of inputs (CTQ, CTR,CTD,CTC – requirements)
- **C**ustomers the process Outputs serve

SIPOC Details

- SIPOC Construction
- SIPOC Evaluation
- SIPOC Loops
- Know the S and C
- Critical Steps
- Share the knowledge

SIPOC Construction

- Use a knowledgeable process team (Critical) often cross functional
- Start with Process – identify all steps
- List what is measured at process steps
- Complete Outputs and if measured - list
- Complete Inputs next – current state

SIPOC Construction

- Complete Suppliers next
- Complete Customers – check as a supplier also and for any inputs
- The SIPOC will help define a projects scope
- The SIPOC supports the Measure Stage – when measurements are listed
- The SIPOC diagram helps fence a project's scope by defining IPO – creates a visual guide for the project team

SIPOC Construction Tips

- List all Suppliers -- is the Customer a supplier (Loop)
- Often Customers provide critical information and or materials
- Inputs must link to a Supplier
- Rank inputs for criticality to process

SIPOC Construction Tips

- If the Customer is a supplier with inputs --- list these.
- The process itself -- transforms inputs – do not over detail -- high level process steps only

SIPOC – SI – PCA / SMT Process

S	I	P	O
Suppliers	Inputs	Process	Outputs
Provider	Input requirements and measures		
Stencil supplier	Solder Stencil		
Paste Supplier	Solder Paste		
PCB Mfg	Blank PCB		
Stock Room	Component Kit		
Component Kit	SMT Feeder setup		
Eng.	SMT Program		
Doc. Control	BOM		
Eng.	Reflow Profile & Program		
Eng.	AOI Program		
Plt Compressor	Shop Air		
Conexus Power Co.	Elect		

SIPOC- SIP – PCA / SMT Process

S	I	P	O
Suppliers	Inputs	Process	Outputs
Provider	Input requirements and measures	Start:	
Stencil supplier	Solder Stencil	Work Order Configured and sent to Mfg. Resources	
Paste Supplier	Solder Paste	Stock Room issues kit to SMT	
PCB Mfg	Blank PCB		
Stock Room	Component Kit		
Component Kit	SMT Feeder setup		
Eng.	SMT Program		
Doc. Control	BOM	High-Level Process Description:	
		1. Setup and load component carriage feeders	
Eng.	Reflow Profile & Program	2. Select correct solder paste and stencil	
Eng.	AOI Program	3. Select correct solder printer program	
Plt Compressor	Shop Air	4. Solder Screen print First PCB	
Conexus Power Co.	Elect	5. Verify first image registration of paste	
		6. Solder Paste Screen print PCBs Top side	
		7. Select correct SMT pick and place program	
		8. Load SMT line with component carriage feeders	
		9. Verify pick placement to Print & BOM	
		10. Populate first board and inspect	
		11. Select correct reflow program	
		12. Reflow one board and inspect	
		13. Select correct AOI program	
		14. Inspect first PCA with AOI	
		15. Release and run line	
		End:	
		Completely populated and reflowed PCA Inspected and confirmed by AOI .	
		Moves to:	
		Next operation or to packaging and shipping and then shipped to end customer.	

SIPOC - SIPO – PCA / SMT Process

S	I	P	O
Suppliers	Inputs	Process	Outputs
Provider	Input requirements and measures	Start:	Output requirements and measures
Stencil supplier	Solder Stencil	Work Order Configured and sent to Mfg. Resources	IPC 610 Class 2 Solder joints
Paste Supplier	Solder Paste	Stock Room issues kit to SMT	
PCB Mfg	Blank PCB		
Stock Room	Component Kit		Correct components per Customer print
Component Kit	SMT Feeder setup		
Eng.	SMT Program		Correct Polarity of Components
Doc. Control	BOM	High-Level Process Description:	
		1. Setup and load component carriage feeders	
Eng.	Reflow Profile & Program	2. Select correct solder paste and stencil	Passes Board level ET
Eng.	AOI Program	3. Select correct solder printer program	
Plt Compressor	Shop Air	4. Solder Screen print First PCB	Passes Full Functional ET
Conexus Power Co.	Elect	5. Verify first image registration of paste	
		6. Solder Paste Screen print PCBs Top side	Meets Agency Callouts
		7. Select correct SMT pick and place program	
		8. Load SMT line with component carriage feeders	Meets ROHS if required
		9. Verify pick placement to Print & BOM	
		10. Populate first board and inspect	Meets IPC Ionic cleanliness level - < 10 u gms/ cm
		11. Select correct reflow program	
		12. Reflow one board and inspect	
		13. Select correct AOI program	
		14. Inspect first PCA with AOI	
		15. Release and run line	
		End:	
		Completely populated and reflowed PCA Inspected and confirmed by AOI .	
		Moves to:	
		Next operation or to packaging and shipping and then shipped to end customer.	

SIPOC – COMPLETE – PCA / SMT Process

S	I	P	O	C
Suppliers	Inputs	Process	Outputs	Customers
Provider	Input requirements and measures	Start:	Output requirements and measures	Receiver
Stencil supplier	Solder Stencil	Work Order Configured and sent to Mfg. Resources	IPC 610 Class 2 Solder	Electrical Test
Paste Supplier	Solder Paste	Stock Room issues kit to SMT	joints	Inspection
PCB Mfg	Blank PCB			Mechanical Assembly
Stock Room	Component Kit		Correct components per Customer print	Wash
Component Kit	SMT Feeder setup			Post solder
Eng.	SMT Program		Correct Polarity of Components	Packaging & Shipping
Customer to Doc. Control	BOM	High-Level Process Description:		OEM - Contract Cust.
		1. Setup and load component carriage feeders		
Eng.	Reflow Profile & Program	2. Select correct solder paste and stencil	Passes Board level ET	
Eng.	AOI Program	3. Select correct solder printer program		
Plt Compressor	Shop Air	4. Solder Screen print First PCB	Passes Full Functional ET	
Conexus Power Co.	Elect	5. Verify first image registration of paste		
Customer	Specifications	6. Solder Paste Screen print PCBs Top side	Meets Agency Regs	
		7. Select correct SMT pick and place program		
		8. Load SMT line with component carriage feeders	Meets ROHS if required	
		9. Verify pick placement to Print & BOM		
		10. Populate first board and inspect	Meets IPC Ionic cleanliness level - < 10 u gms/ cm	
		11. Select correct reflow program		
		12. Reflow one board and inspect		
		13. Select correct AOI program		
		14. Inspect first PCA with AOI		
		15. Release and run line		
		End:		
		Completely populated and reflowed PCA Inspected and confirmed by AOI .		
		Moves to:		
		Next operation or to packaging and shipping and then shipped to end customer.		

SIPOC – Ranked – CTQ included --- PCA / SMT Process

Suppliers	Risk	Inputs	Process	Outputs	CTQ
Provider	Rank	Input requirements and measures	Start:	Output requirements and measures	Identify
Stencil supplier	2	Solder Stencil	Work Order Configured and sent to Mfg. Resources	IPC 610 Class 2 Solder	Yes
Paste Supplier	1	Solder Paste	Stock Room issues kit to SMT	joints	
PCB Mfg	2	Blank PCB			
Stock Room	3	Component Kit		Correct components per Customer print	Yes
Component Kit	3	SMT Feeder setup			
Eng.	1	SMT Program		Correct Polarity of Components	Yes
Customer to Doc. Control	3	BOM	High-Level Process Description:		
			1. Setup and load component carriage feeders		
Eng.	1	Reflow Profile & Program	2. Select correct solder paste and stencil	Passes Board level ET	Yes
Eng.	1	AOI Program	3. Select correct solder printer program		
Plt Compressor	1	Shop Air	4. Solder Screen print First PCB	Passes Full Functional ET	Yes
Conexus Power Co.	1	Elect	5. Verify first image registration of paste		
Customer	2	Specifications	6. Solder Paste Screen print PCBs Top side	Meets Agency Regs	Yes
			7. Select correct SMT pick and place program		
			8. Load SMT line with component carriage feeders	Meets ROHS if required	Yes
			9. Verify pick placement to Print & BOM		
			10. Populate first board and inspect	Meets IPC Ionic cleanliness level - < 10 u gms/ cm	Yes
			11. Select correct reflow program		
			12. Reflow one board and inspect		
			13. Select correct AOI program		
			14. Inspect first PCA with AOI		
			15. Release and run line		

Suppliers	Risk	Inputs	Process	Outputs	CTQ
Provider	Rank	Input requirements and measures	Start:	Output requirements and measures	Identify
Stencil supplier	2	Solder Stencil	Work Order Configured and sent to Mfg. Resources	IPC 610 Class 2 Solder	Yes
Paste Supplier	1	Solder Paste	Stock Room issues kit to SMT	joints	
PCB Mfg	2	Blank PCB			
Stock Room	3	Component Kit		Correct components per Customer print	Yes
Component Kit	3	SMT Feeder setup			
Eng.	1	SMT Program		Correct Polarity of Components	Yes
Customer to Doc. Control	3	BOM	High-Level Process Description:	Yield good / bad	
			1. Setup and load component carriage feeders		
Eng.	1	Reflow Profile & Program	2. Select correct solder paste and stencil	Passes Board level ET	Yes
Eng.	1	AOI Program	3. Select correct solder printer program		
Plt Compressor	1	Shop Air	4. Solder Screen print First PCB	Passes Full Functional ET	Yes
Conexus Power Co.	1	Elect	5. Verify first image registration of paste		
Customer	2	Specifications	6. Solder Paste Screen print PCBs Top side	Meets Agency Regs	Yes
			7. Select correct SMT pick and place program		
			8. Load SMT line with component carriage feeders	Meets ROHS if required	Yes
			9. Verify pick placement to Print & BOM		
			10. Populate first board and inspect	Meets IPC Ionic cleanliness level - < 10 u gms/ cm	Yes
			11. Select correct reflow program		
			12. Reflow one board and inspect		
			13. Select correct AOI program		
			14. Inspect first PCA with AOI		
			15. Release and run line		
			End:		
			Completely populated and reflowed PCA Inspected and confirmed by AOI . - 100% yield meets print.		
			Moves to:		
			Next operation or to packaging and shipping and then shipped to end customer.		

SIPOC ASQ Dinner Meeting Process

Suppliers	Inputs	Process	Outputs	Customers
Provider	Input requirements and measures	Start: ASQ Dinner Meeting Selection - Process	Output requirements and measures	Receiver
		High-Level Process Description:		
ASQ Program Committee	Member meeting Survey information	Program Committee meets	Meeting Improvement action	ASQ Members
	Membership Profile	Program Selections discussed	Meeting topic selected	ASQ Program Committee
ASQ Members	Speaker Lists	Programs proposed	Meeting Speakers Selected	
	Meeting Topic List	Program voted on & selected	Meeting location selected	
ASQ National Org.	Last meeting member survey results	Speaker - research assigned	Meeting Meal Selected	
	Past meeting attendance records	Location - research assigned	Meeting promotion completed	
Quality and Industry Magazines	Past meeting location information	Presenters - proposed		
	Past meeting meal selection	Presenter Selected		
		Presenter contacted - affirmed		
	Quality Topic Publication information	Location proposed		
		Location affirmed and reserved		
		Meal proposed		
		Meal Selected		
		Meeting notice and details published in News Letter		
		Payments collected		
		Meeting held and feedback collected		
		End		
		Dinner meeting conducted and feedback reviewed by program committee at next meeting for improvement and success - did the meeting meet the ASQ members needs and expectations		

SIPOC Example - Final Inspection Process

S	I	P	O	C
Suppliers	Inputs	Process	Outputs	Customers
Provider	Input requirements and measures	Start: Final Inspection Process	Output requirements and measures	Receiver
		High-Level Process Description:		
Manufacturing	Final Inspection Procedure	Product staged for inspection	Completed final Inspection record	Shipping
Engineering	Finished Product	Insp Procedure pulled per Product Part Number	Tagged Inspection status	Stock room
Customer	Sampling Plan	Inspection tools selected per procedure	Move Tag	Distribution Center
Doc. Control	Inspection Equipment	Product Specification pulled	Reject Tag	Material movement operator
Quality Engineering	Specifications	Customer Prints pulled	Accept Tag	Purchasing Customer
Facilities	Customer Prints	Cosmetic Criteria Specification pulled	Stamped container Insp Status	NCM area
	Cosmetic Standards	Sample table pulled	NCM if rejected	
	Inspection Record Form	Sampled size selected per Inspection procedure		
	Inspection Status Tag	Sample Product measured		
	Inspection Work area / station	Measurement results recorded		
		Cosmetic Inspection results recorded		
		Pass / Fail decision made and recorded		
		Product marked as passed ready to move.		
		End		
		Inspection complete and results recorded and product status marked and moved according to pass / fail status		

SIPOC Analysis Tips

- Use the SIPOC to identify Suppliers that may impact project success
- Stop and look at bad or problematic Suppliers for action – may require action before project started
- Projects are directed at improving an output
- Project scope fits inside the SIPOC
- The Input Process Outputs define scope

SIPOC Analysis Tips

- Use VOC (Voice of the Customer)
- Customer's should agree with outputs
- Have Customers review outputs
- SIPOC helps find key customers of the Project - by listing them
- Rank SIPOC inputs and outputs to help determine project focus – shows weak or risk areas
- Ranking helps a project with impact

SIPOC – Critical Project Guidance Tool

– Benefits

- Provides easy to see process boundaries
- Critical project scope tool
- Easy to use
- Fences project boundaries
- Directs project effort

SIPOC – Critical Project Guidance Tool

– Benefits

- Stops a project from failing at start by helping with a bad supplier or input
- Provides risk points – for analysis
- Supports VOC
- Identifies C & M elements –
Constraints and measures

SIPOC – Critical Project Guidance Tool

– Benefits

- Provides CTQ, CTR,CTD,CTC identifiers
- Provides key customers
- Provides key outputs and measures
- Acts as part of the project road map

Any Questions
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THANK YOU

I hope you found this tool brief
helpful

Best Regards

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