Metrics-Based Process Mapping

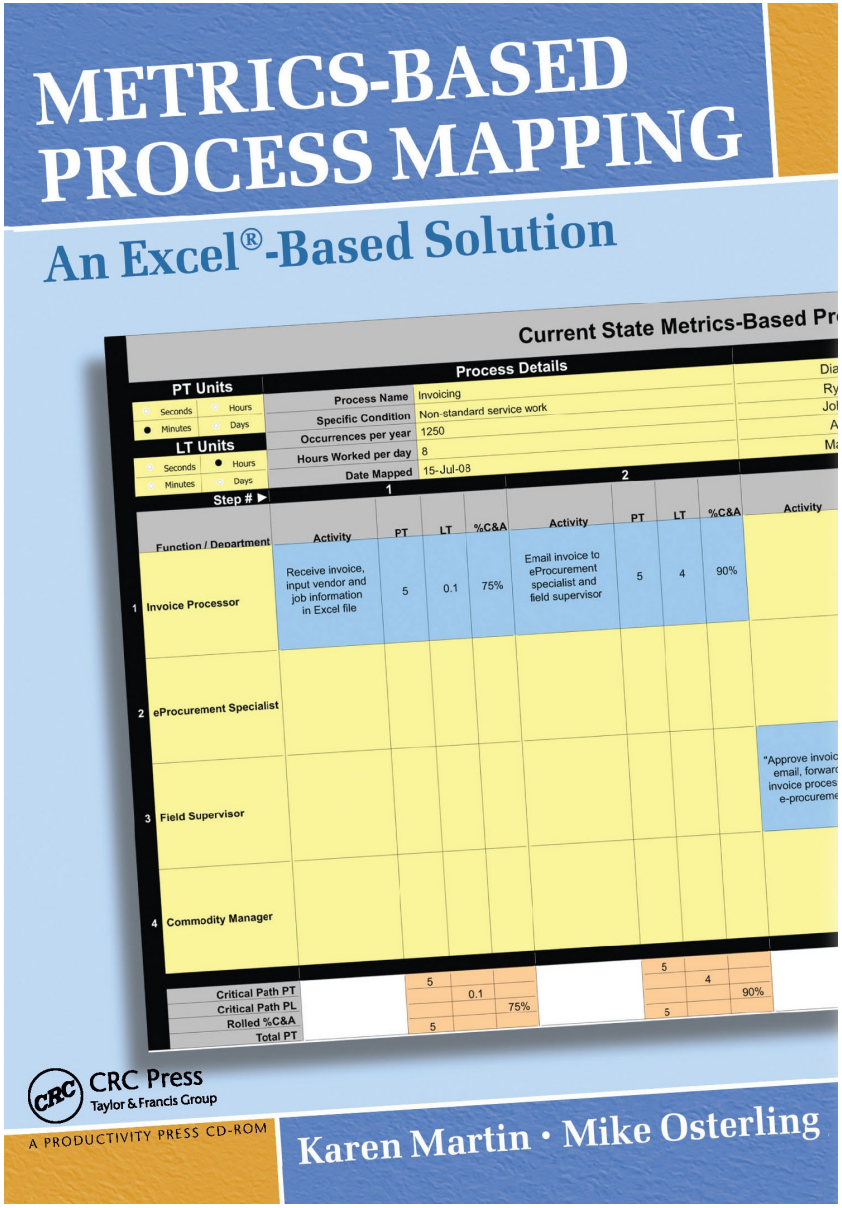
Excel-Based Tool for Mapping Non-Manufacturing Processes

Just Released from Productivity Press

A process mapping tool from Karen Martin & Mike Osterling

Authors of

The Kaizen Event Planner:
Achieving Rapid Improvement in Office, Service, and Technical Environments



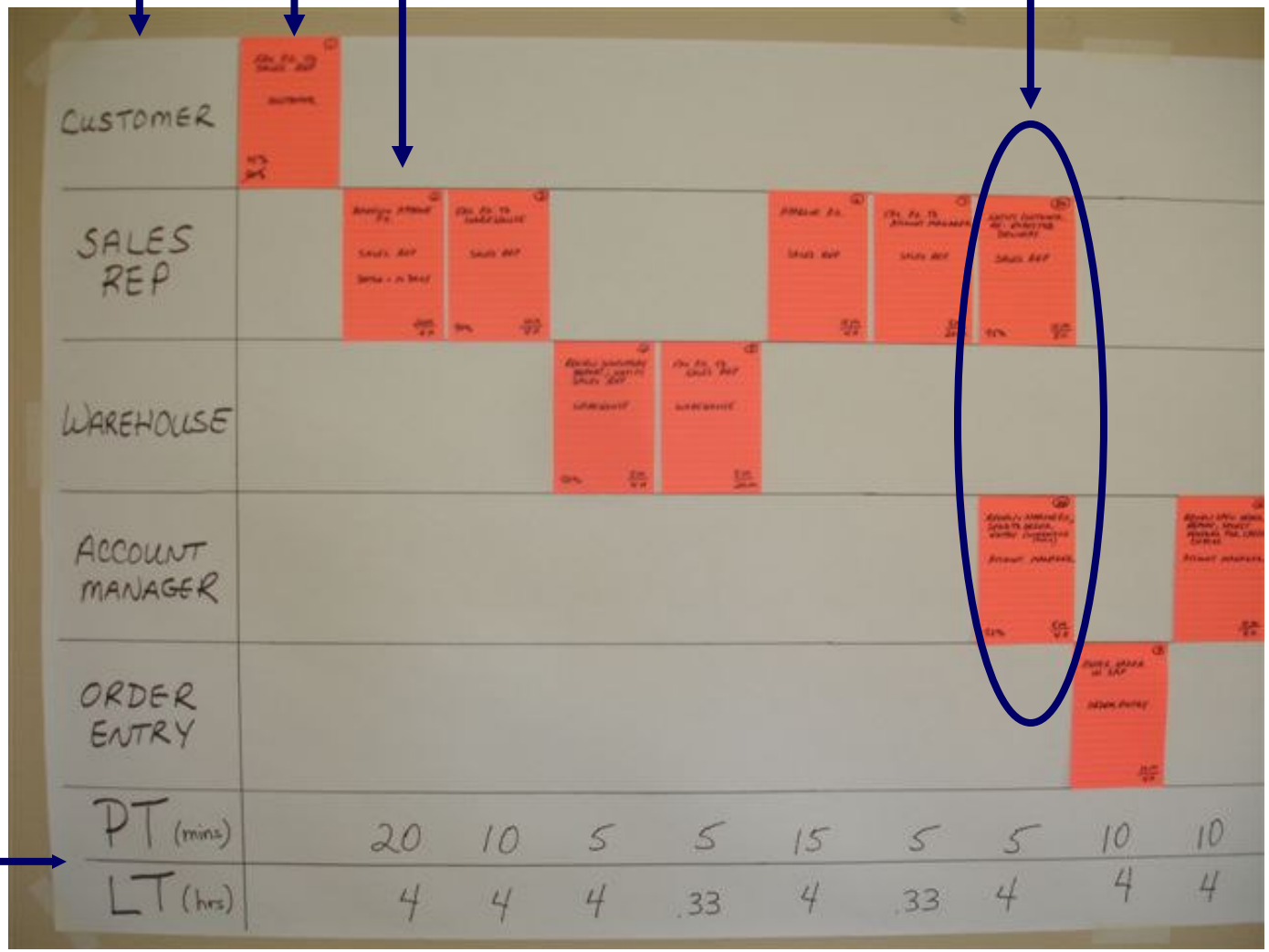
Metrics-Based Process Mapping (MBPM): What is it?

- Structured method for process analysis and design, documenting standard work, and monitoring expected performance levels.
- Visual methodology that integrates key time and quality metrics into conventional cross-functional process maps.

Metrics-Based Process Mapping (MBPM): Why use it?

- An effective tool for supporting lean transformations in office, service, and knowledge work environments.
- Fills a void with existing process mapping techniques
- An easy-to-use tool that facilitates:
  - Gaining a deeper understanding of specific causes for the macro-level waste identified on a value stream map
  - Designing tactical-level improvements
- Enables data-based decisions

MBPM Structure



Timeline

Steps for Creating the MBPM

- Document the current process
  - Step 1: Document each activity and handoff(s)
  - Step 2: Add key metrics (time and quality) & barriers to flow (e.g. batching, equipment downtime, shared resources, etc.)
  - Step 3: Define the critical path
  - Step 4: Create the timeline
  - Step 5: Calculate summary metrics
  - Step 6: Label value-adding (VA) and necessary non-value adding (N) steps (unlabeled steps are deemed waste)
- Identify root causes for the waste & other barriers to flow, and countermeasures to eliminate root causes
- Design the future state & calculate projected metrics

Why Capture the MBPM Electronically?

- Archive the team's work
- Distribute the maps to remote locations
- Document the new standard work for the process
  - Training/retraining staff
  - Monitoring process performance
- Communicate the impact of Kaizen Events and other improvement activities

Product Information

- The CD contains three files:
  - **Mapping Essentials.pdf** – describes the step-by-step approach for creating MBPMs manually, using paper and post-its
  - **User's Guide.pdf** – describes the tool's functionality and the steps to creating electronic versions of the MBPMs
  - **MBPM.xlt** – the Excel-based tool
    - Including a ***Quick Start Guide*** for mature Excel users and those who already know how to create MBPMs

The Excel-Based Tool: Easy to Use

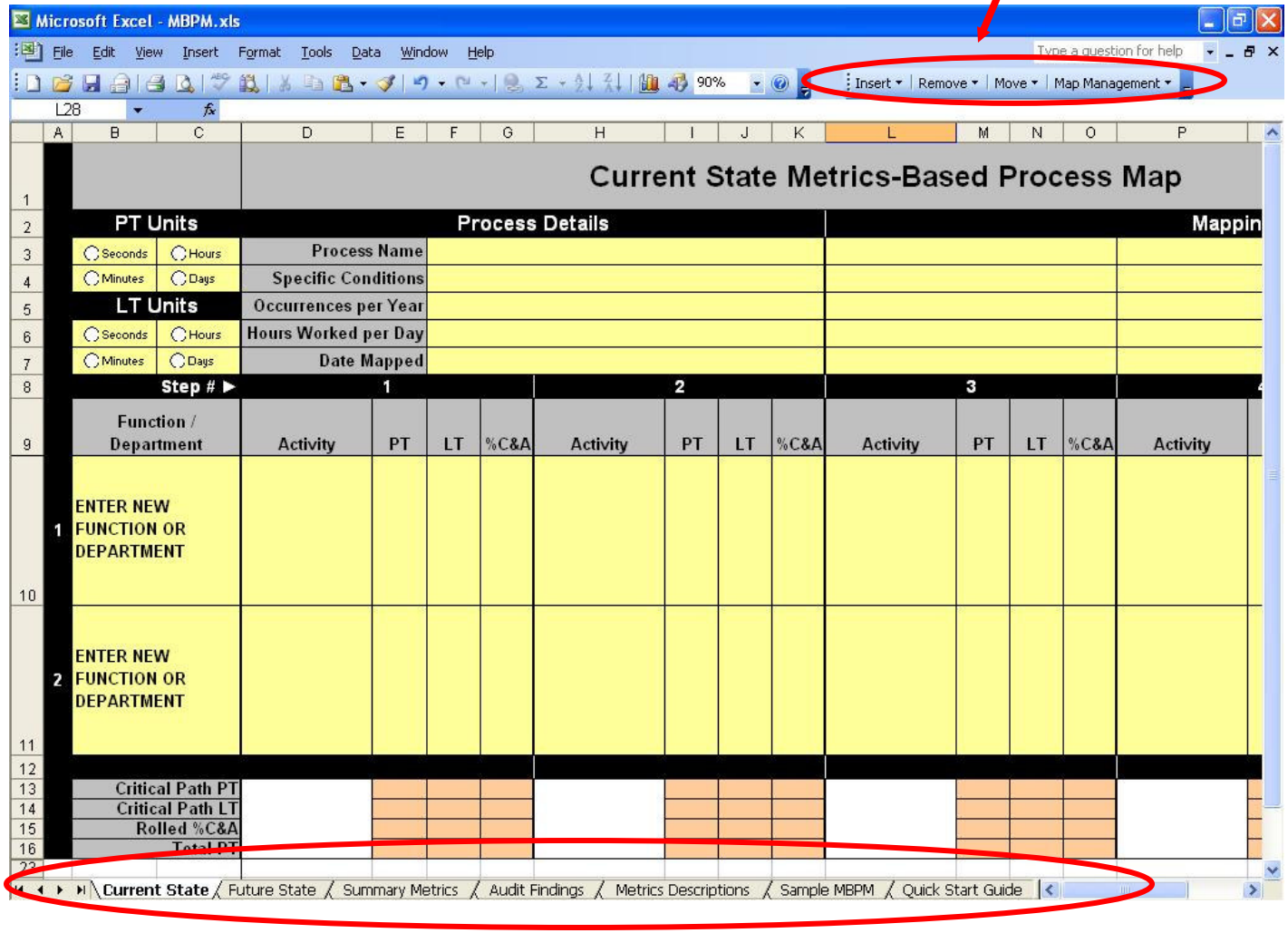
- Intuitive design
- Custom tool bar and pull-down menus
- Color-coded cells
- Automated metrics calculations
- Mistake-proofing audit feature
- Easily distribute electronic “read only” versions of the process flow to non-licensed users

Tool Layout

Custom toolbar with easy to use pull-down menus

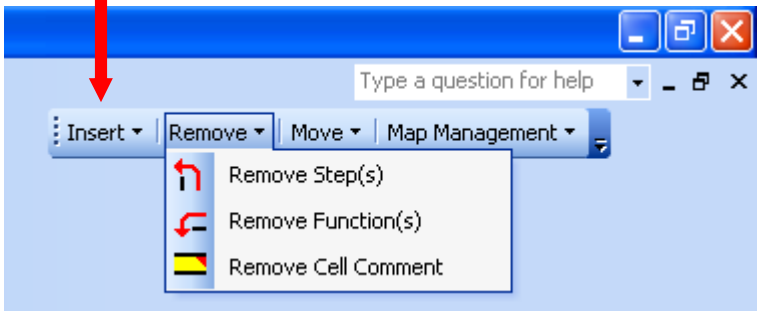
Seven sheets

- Current State
- Future State
- Summary Metrics
- Audit Findings
- Metrics Descriptions
- Sample MBPM
- Quick Start Guide

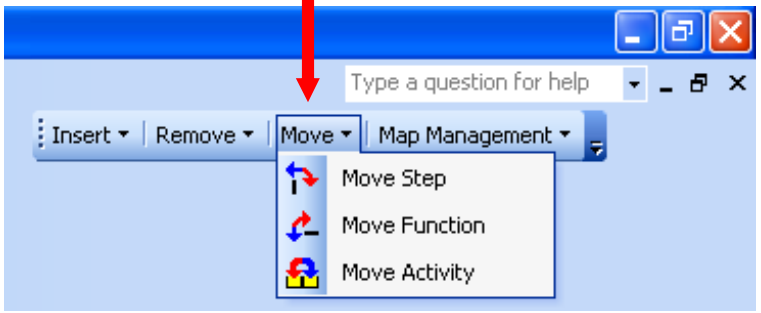


Custom Toolbar Features

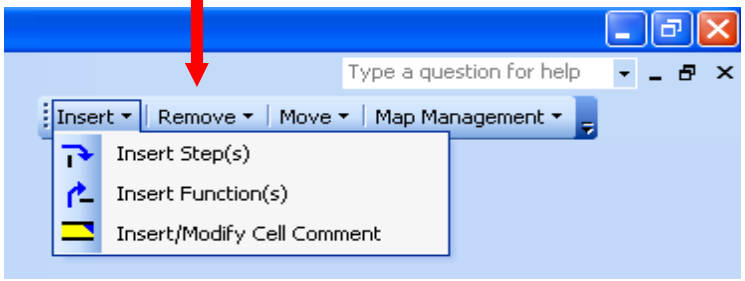
Insert



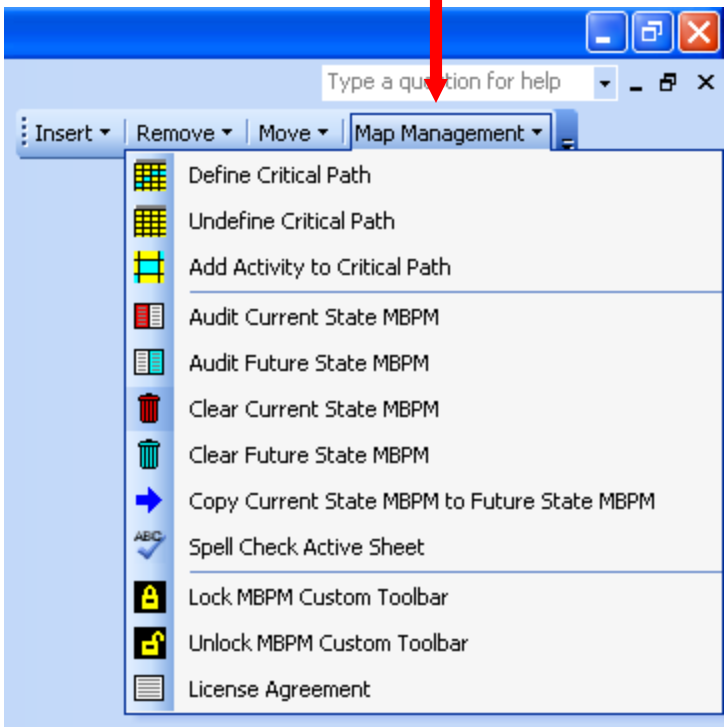
Move



Remove



Map Management



Color-Coded Cells Indicate Function

- Yellow – accepts user data entry
- Salmon / tan – auto-populates
- Black/gray/white – column/row labels & blank space

Step # ►	1				2				3				4			
Function / Department	Activity	PT	LT	%C&A	Activity	PT	LT	%C&A	Activity	PT	LT	%C&A	Activity	PT	LT	%C&A
ENTER NEW FUNCTION OR DEPARTMENT																
ENTER NEW FUNCTION OR DEPARTMENT																
Critical Path PT																
Critical Path LT																
Rolled %C&A																
Total PT																

Color-Coded Summary Metrics Sheet

Summary Metrics

0 Decimal Places | 1 Decimal Place | 2 Decimal Places

Predefined Performance Metrics

Metric	Current State Value	Current State Units	Projected Future State Value	Projected Future State Units	Desired Direction Up	Desired Direction Down	Projected Improvement
Critical Path PT Sum	140.0	minutes	45.0	minutes		◉	67.9%
Critical Path LT Sum	38.7	hours	14.2	hours		◉	63.3%
Activity Ratio	6.0	%	5.3	%	◉		-11.7%
Rolled First Pass Yield	21.4	%	75.3	%	◉		251.9%
# of Activities	16	activities	8	activities		◉	50.0%

Capacity Calculations

Metric	Current State Value	Current State Units	Projected Future State Value	Projected Future State Units	Projected Change
Sum of Total PTs	155.0	minutes	45.0	minutes	-71.0%
Occurrences per Year	37500	occurrences	37500	occurrences	0.0%
Available Work Hours per Year	1950	hours	1950	hours	0.0%
Labor Requirements	49.7	FTEs	14.4	FTEs	-71.0%

User-defined Performance Metrics

Metric	Current State Value	Current State Units	Projected Future State Value	Projected Future State Units	Desired Direction Up	Desired Direction Down	Projected Improvement
Number of reviews & approvals	4.0	reviews	1.0	review	○	◉	75.0%
					○	○	

- Auto-Calculates:
  - Summary time and quality metrics for before and after maps
  - Projected % improvement (color-coded for visual ease)
  - Staffing requirements
  - User-defined metrics

Map Structure

Functions

Process Steps

Current State Metrics-Based Process Map

PT Units		Process Details		Mapping Team		
○ Seconds	○ Hours	Process Name	Order Fulfillment	Diane O'Shea	Ryan Austin	
◉ Minutes	○ Days	Specific Conditions	Domestic orders through sales force	Sean Michaels	Mary Townsend	
LT Units		Occurrences per Year	37,500	Sam Parks		
○ Seconds	◉ Hours	Hours Worked per Day	8	Sally Dampier		**Facilitator**
○ Minutes	○ Days	Date Mapped	25-Jun-08	Michael Prichard		Dave Morgan

	Step # ►	1				2				3				4				5			
	Function / Department	Activity	PT	LT	%C&A	Activity	PT	LT	%C&A	Activity	PT	LT	%C&A	Activity	PT	LT	%C&A	Activity	PT	LT	%C&A
1	Customer	Fax PO to Sales Rep	0	0	45%																
2	Sales Rep					Review PO; clarify with customer as needed	20	2	90%	Fax PO to warehouse	10	4	90%								
5	Finance																				
6	Warehouse / Shipping													Check inventory levels; notify Sales Rep re: status	5	4	95%	Fax PO to Sales Rep	5	0.33	90%
	Critical Path PT		0				20				10				5				5		
	Critical Path LT			0				2				4				4				0.33	
	Rolled %C&A				45%				90%				90%				95%				90%
	Total PT		0				20				10				5				5		

Key Metrics & Timeline

Blue color-coded cells indicate the critical path

Archiving your MPBM
5 Easy Steps

1. Enter header information
2. Insert functions and steps
3. Create the current state map
   - Enter activities & key metrics
   - Define the critical path
   - Audit the map
4. Create the future state map
   - Enter activities & key metrics
   - Define the critical path
   - Audit the map
5. View the Summary Metrics Sheet

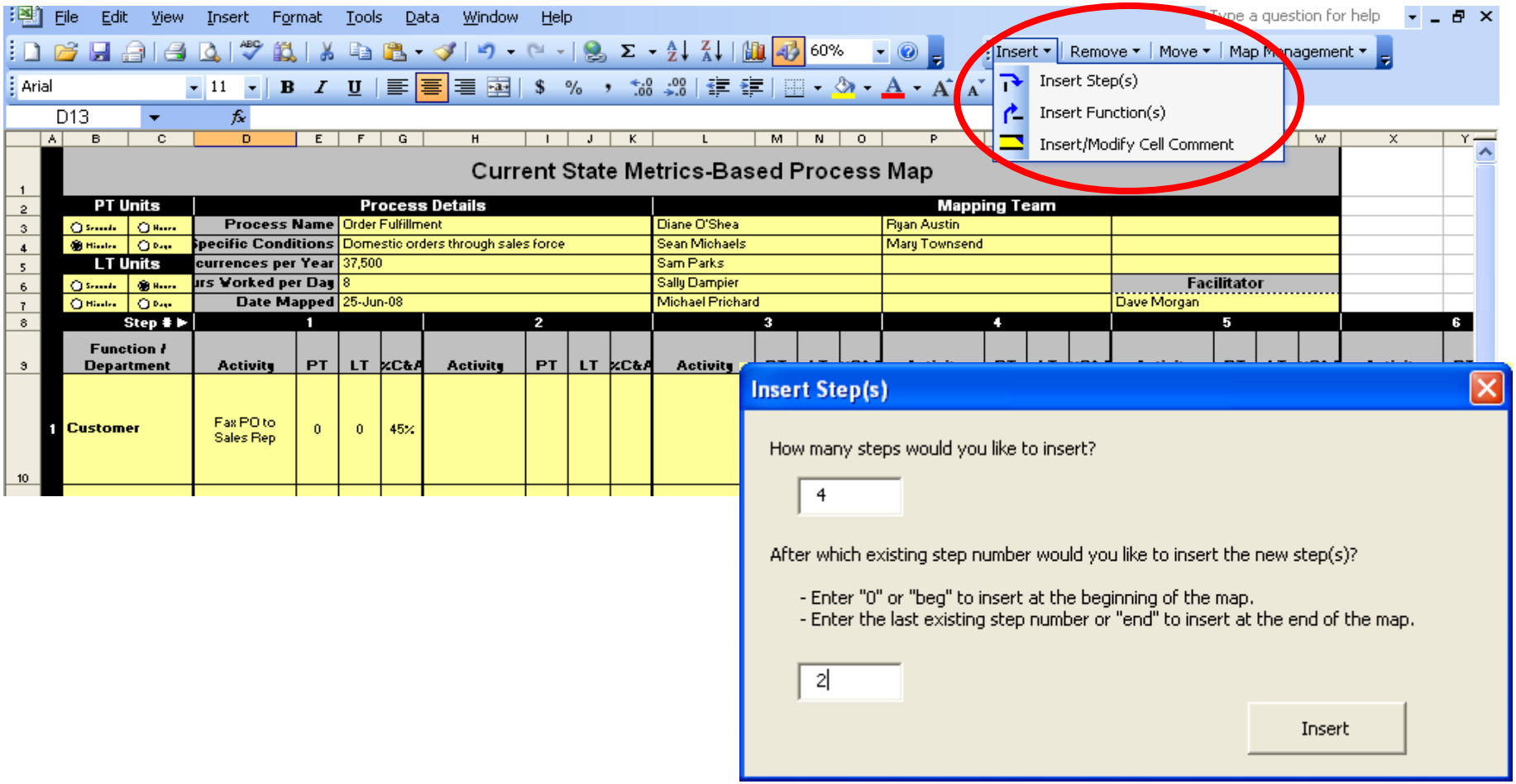
Step 1
Enter Header Information

Current State Metrics-Based Process Map

PT Units		Process Details			Mapping Team
○ Seconds	○ Hours	Process Name	Order Fulfillment	Diane O'Shea	Ryan Austin
◉ Minutes	○ Days	Specific Conditions	Domestic orders through sales force	Sean Michaels	Mary Townsend
LT Units		Occurrences per Year	37,500	Sam Parks	
○ Seconds	◉ Hours	Hours Worked per Day	8	Sally Dampier	
○ Minutes	○ Days	Date Mapped	25-Jun-08	Michael Prichard	

Define the units of measure being used

Step 2A
Insert Functions and Steps



Step 2B
Enter Function Names

	PT Units			Process
	○ Seconds	○ Hours	Process Name	Order Fulfillmer
	◉ Minutes	○ Days	Specific Conditions	Domestic orders
	LT Units		Occurrences per Year	37,500
	○ Seconds	◉ Hours	Hours Worked per Day	8
	○ Minutes	○ Days	Date Mapped	25-Jun-08
	Step # ►		1	

	Function / Department	Activity	PT	LT	%C&A
1	Customer	Fax PO to Sales Rep	0	0	45%
2	Sales Rep				
3	Account Manager				

Step 3A
Enter Activities and Key Metrics

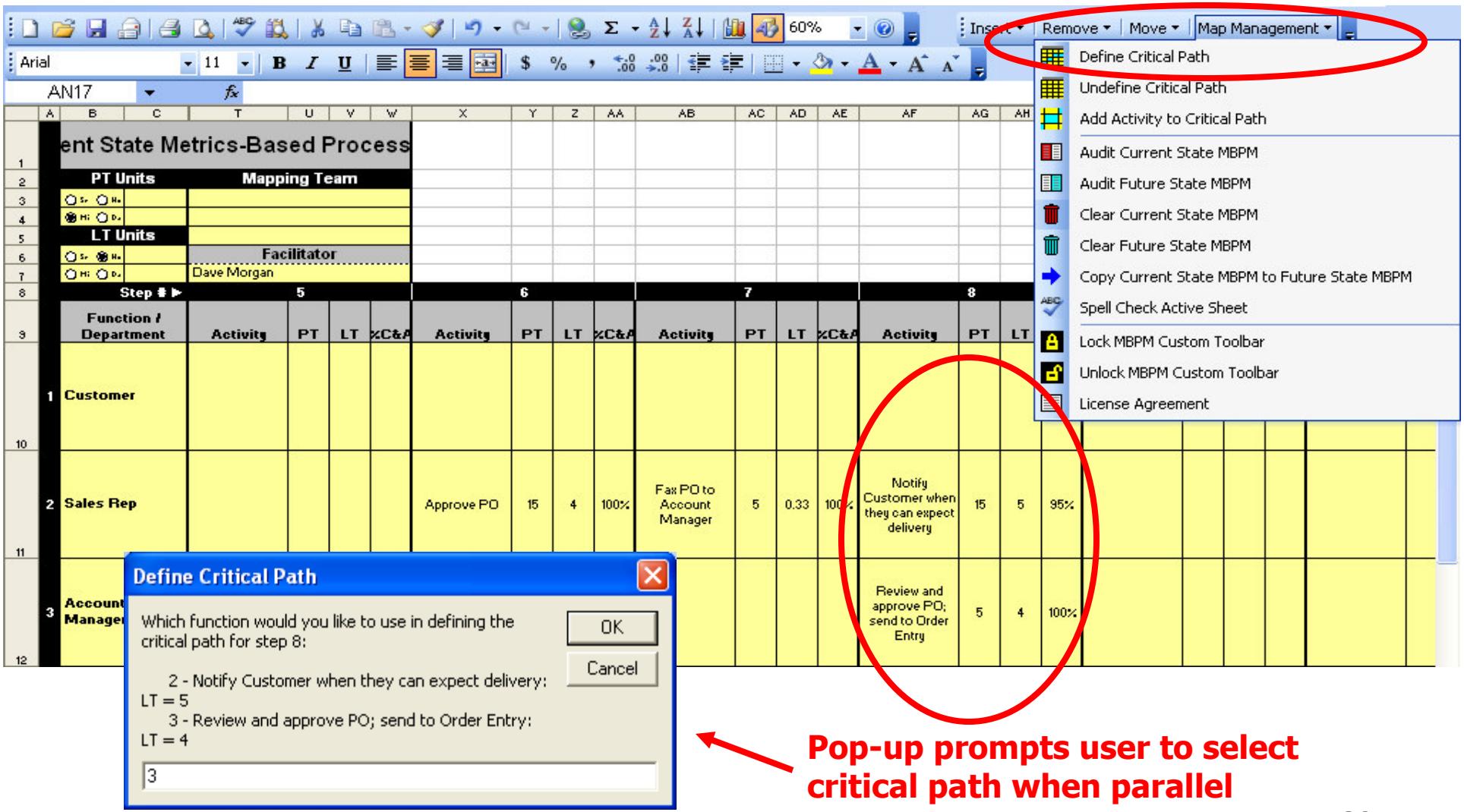
	PT Units		Process	
	○ Seconds	○ Hours	Process Name	Order Fulfillmer
	◉ Minutes	○ Days	Specific Conditions	Domestic orders
	LT Units		Occurrences per Year	37,500
	○ Seconds	◉ Hours	Hours Worked per Day	8
	○ Minutes	○ Days	Date Mapped	25-Jun-08
	Step # ▶		1	

	Function / Department	Activity	PT	LT	%C&A
1	Customer	Fax PO to Sales Rep	0	0	45%

Key metrics

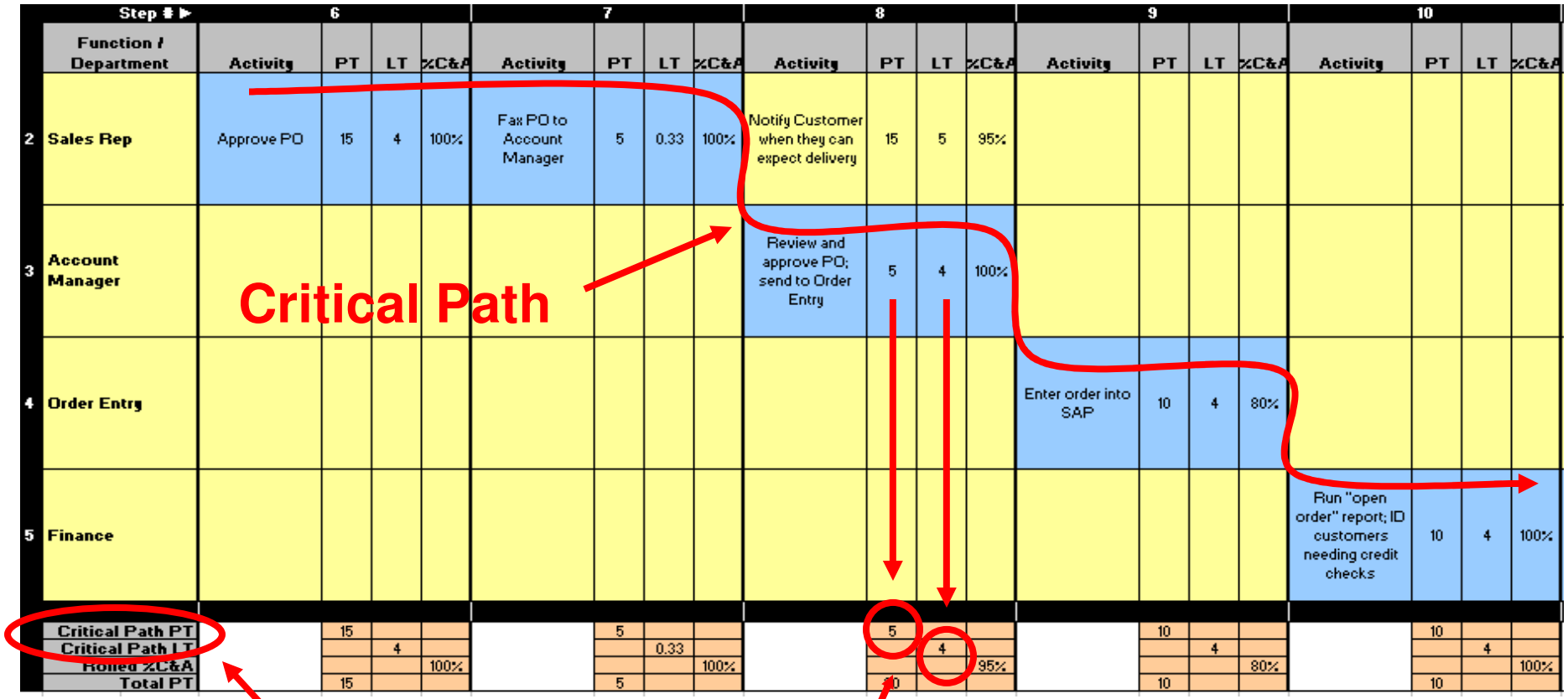
- Process Time (PT)
- Lead Time (LT)
- Percent Complete & Accurate (%C&A)

Step 3B
Define the Critical Path

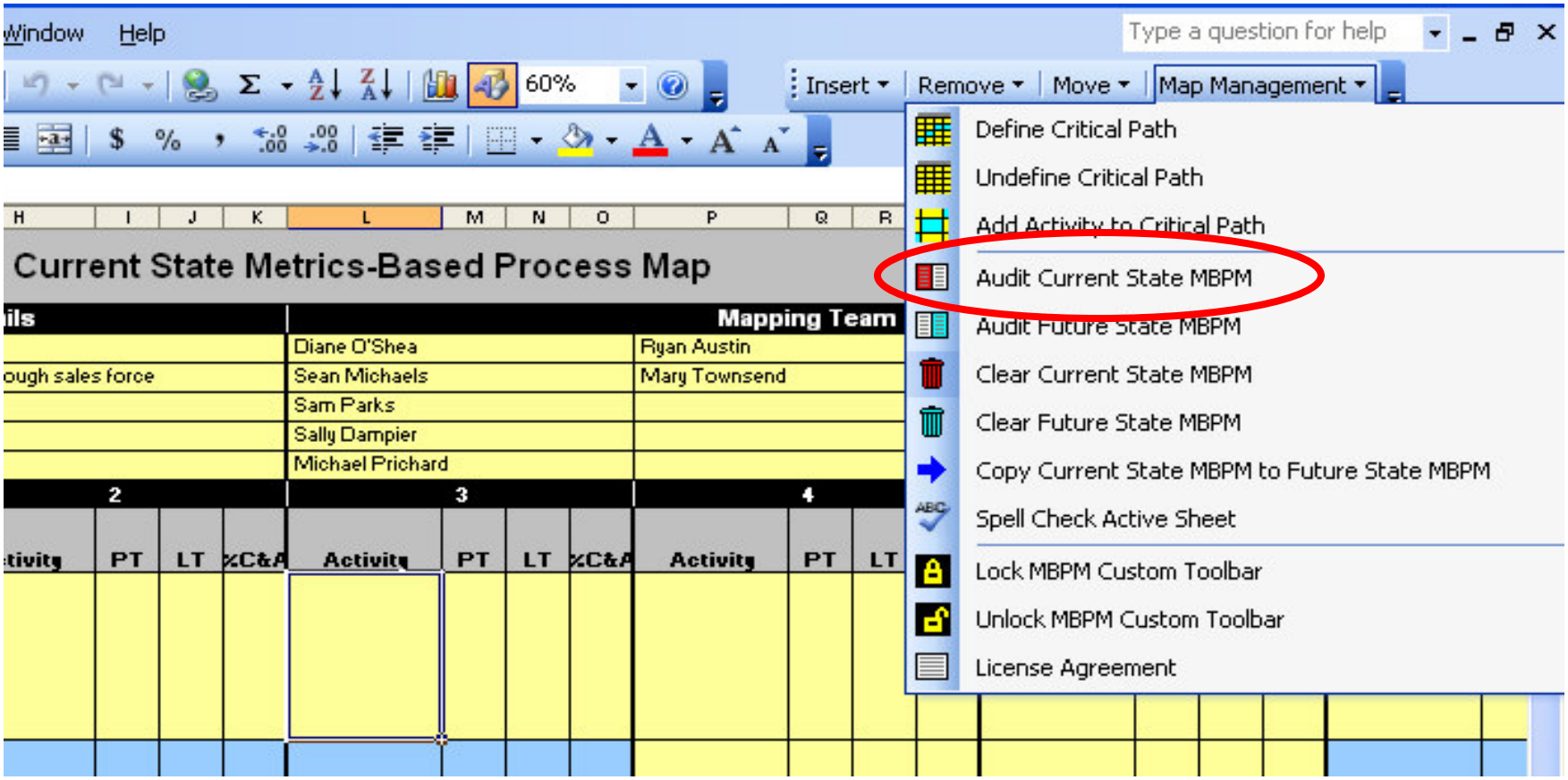


Pop-up prompts user to select critical path when parallel activities are present

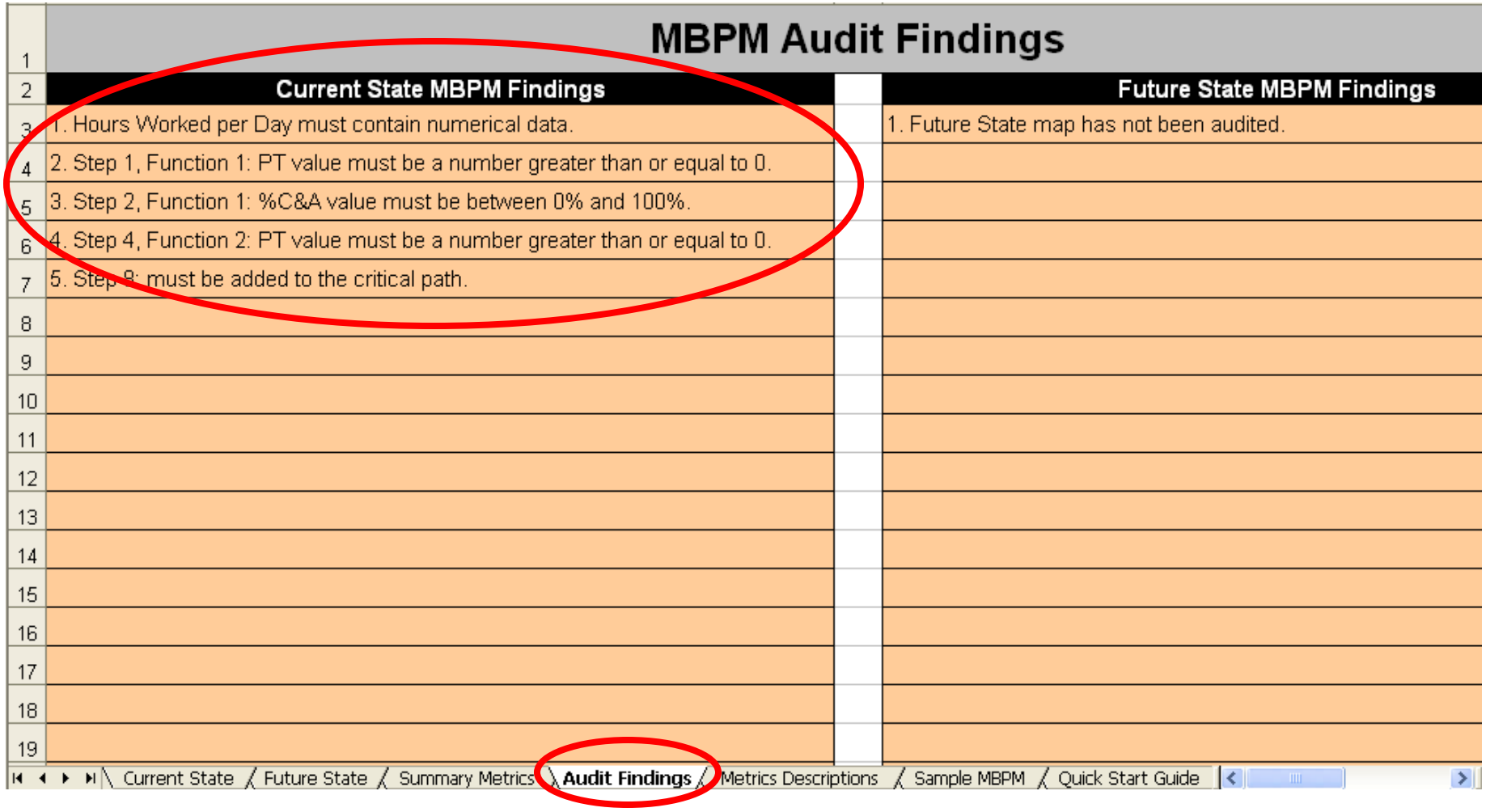
The Critical Path: Blue Color-Coding



Step 3C
Audit the Map



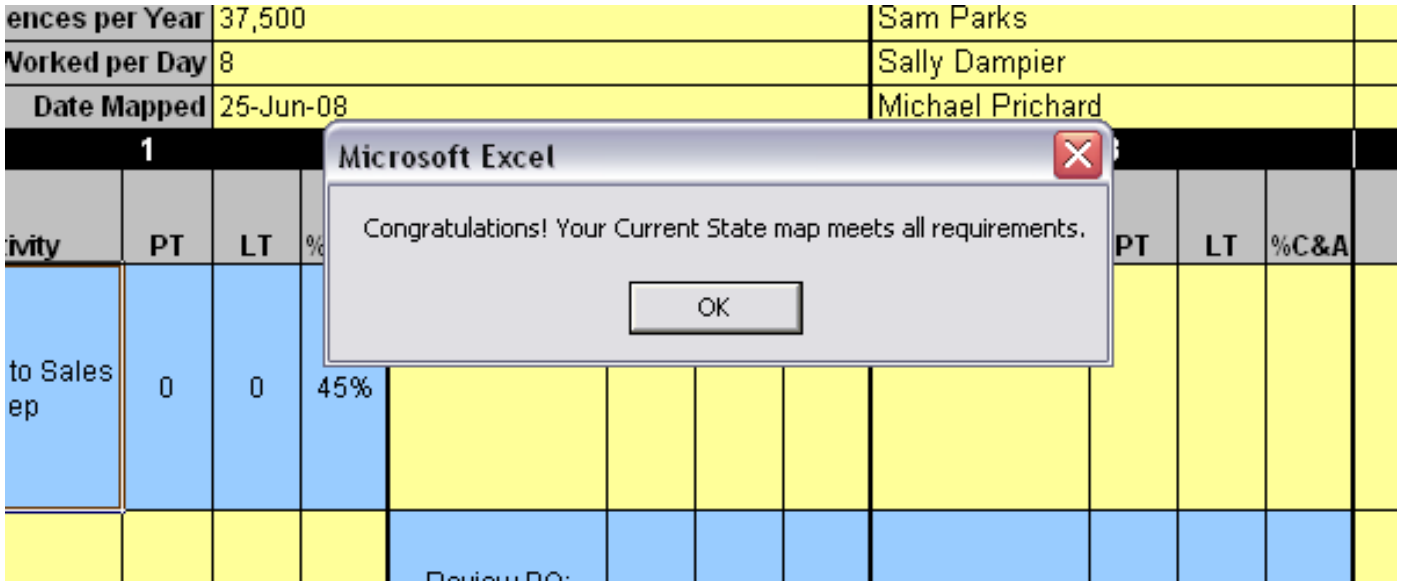
Defined map requirements must be met to generate summary metrics



MBPM Audit Findings		
Current State MBPM Findings		**Future State MBPM Findings**
1. Hours Worked per Day must contain numerical data.		1. Future State map has not been audited.
2. Step 1, Function 1: PT value must be a number greater than or equal to 0.		
3. Step 2, Function 1: %C&A value must be between 0% and 100%.		
4. Step 4, Function 2: PT value must be a number greater than or equal to 0.		
5. Step 8: must be added to the critical path.		

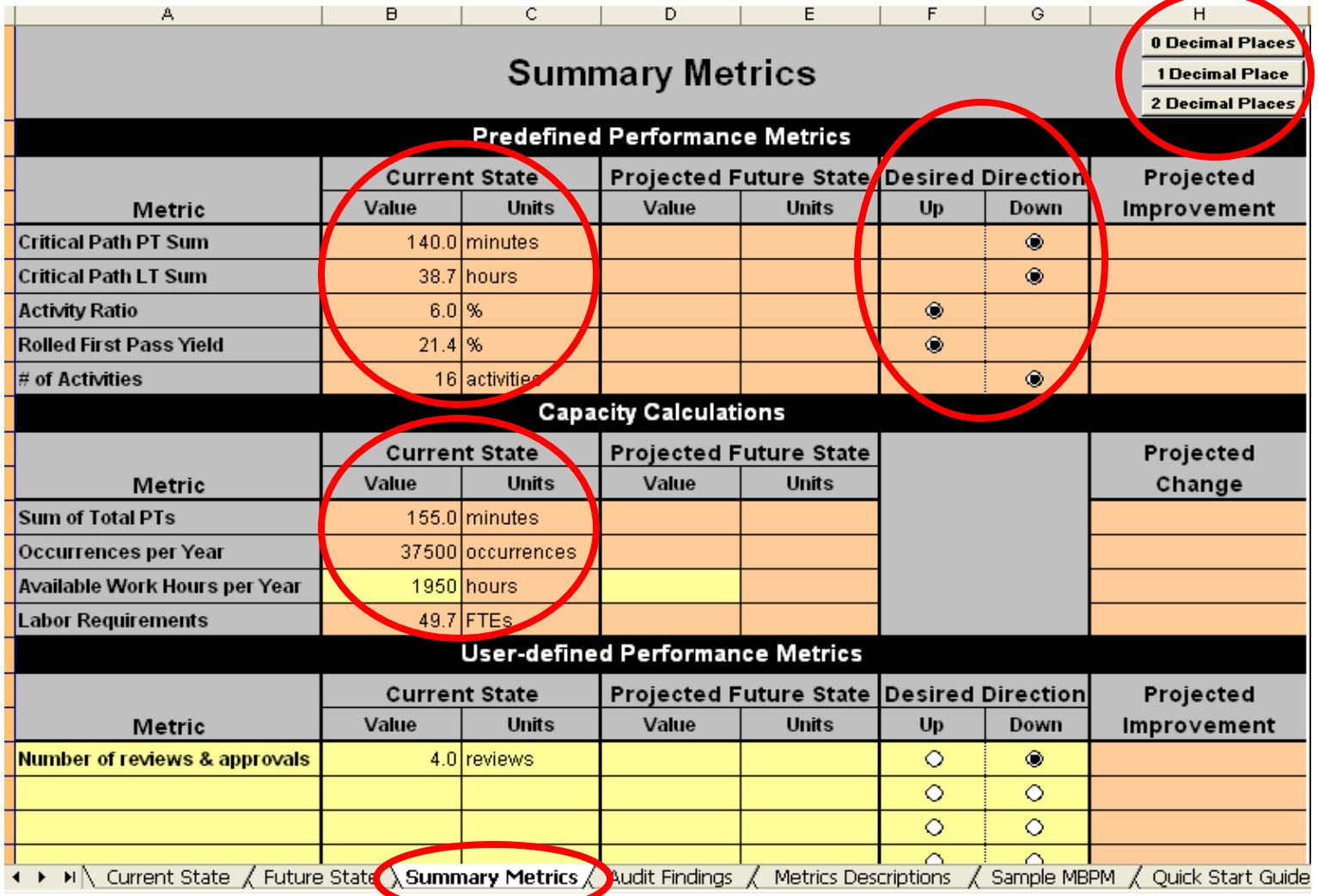
Current State | Future State | Summary Metrics | **Audit Findings** | Metrics Descriptions | Sample MBPM | Quick Start Guide

Successful audit results in generation of summary metrics



	MBPM Audit Findings		
2	Current State MBPM Findings		Future State MBPM Findings
3	1. Current State map meets all audit requirements.		1. Future State map has not been audited.
4			
5			
6			
7			

Summary Metrics Auto-Calculate



Summary Metrics

0 Decimal Places | 1 Decimal Place | 2 Decimal Places

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# of Activities	16	activities				◉	

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User-defined Performance Metrics

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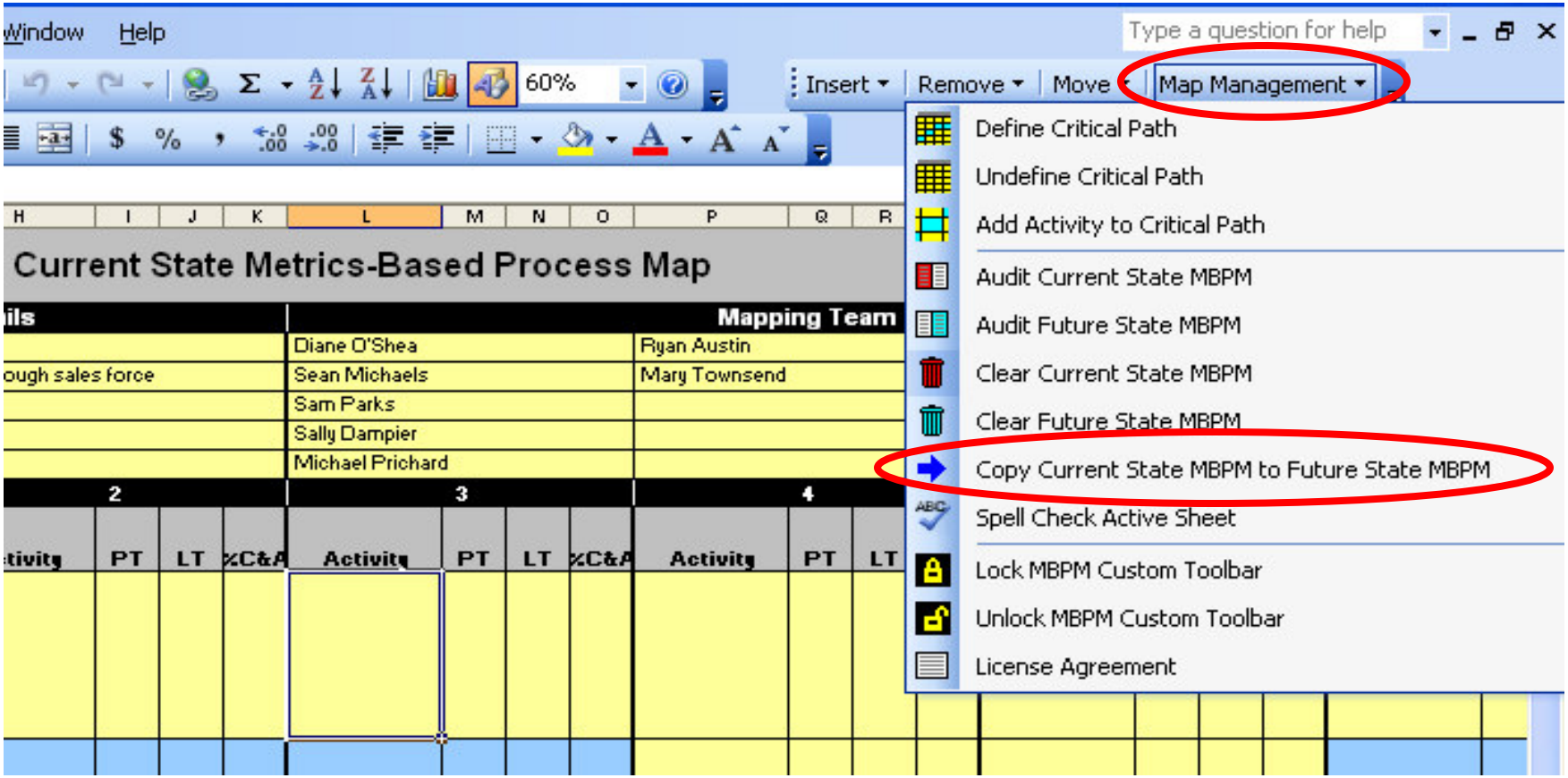
Number of reviews & approvals	4.0	reviews			○	◉	
					○	○	
					○	○	
					○	○	

Current State | Future State | Summary Metrics | Audit Findings | Metrics Descriptions | Sample MBPM | Quick Start Guide

Flexible options for desired number of decimal places

Step 4
Create Future State Map
(Start from Scratch or Copy CS to FS)



Step 4 (continued)
Document the Future State Map

- Enter activities and key metrics
- Define the Future State Critical Path
- Audit the Future State Map

Step 5
View the Summary Metrics

Summary Metrics

0 Decimal Places | 1 Decimal Place | 2 Decimal Places

Predefined Performance Metrics

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Number of reviews & approvals	4.0	reviews	1.0	review	◇	◉	75.0%
					◇	◇	

Color-coded cells based on desired direction for projected improvement

User-Defined Performance Metrics Provide Flexibility

Summary Metrics

0 Decimal Places | 1 Decimal Place | 2 Decimal Places

Predefined Performance Metrics

Metric	Current State		Projected Future State		Desired Direction		Projected Improvement
	Value	Units	Value	Units	Up	Down	
Critical Path PT Sum	140.0	minutes	45.0	minutes		◉	67.9%
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User-defined Performance Metrics

Metric	Current State		Projected Future State		Desired Direction		Projected Improvement
	Value	Units	Value	Units	Up	Down	
Number of reviews & approvals	4.0	reviews	1.0	review	○	◉	75.0%
					○	○	

Summary

- ***Different than VSM*** – Used to document the *micro-level* current state for a process
- Facilitates the design of an improved future state
- Facilitates measuring and analyzing office, service, and knowledge-work processes in terms of both time ***and*** quality.
- Measures the impact of improvements
- Visual aid for training and monitoring process performance
- Effective tool to record key activities and calculate the impact of Kaizen Events

Licensing Information

- Each CD provides one license only.
  - Licensees may create and/or edit maps.
  - Others may view the maps but may not create new or edit existing maps.
  - The maps may be shared for viewing purposes after using the “Lock Toolbar” feature on the custom toolbar, which disables much of the map’s functionality.

One license per CD purchased

Discounts are available for volume purchases

5-9 copies = 5% discount

10-19 copies = 10% discount

≥20 copies = 15% discount

For more information, Contact Chris Manion at Chris.manion@taylorandfrancis.com

Final Notes

- Must be run on a PC with Excel 2003 or later.
- Detailed information for creating metrics-based process maps can be found in:
  - Chapter 12 of ***The Kaizen Event Planner: Achieving Rapid Improvements in Office, Service, and Technical Environments,*** Productivity Press, October 2007.
  - *Mapping Essentials* and *User's Guide* included with ***Metrics-Based Process Mapping: An Excel-Based Solution,*** Productivity Press, July 2008.
  - www.mbpmapping.com

For Further Information

www.mbpmapping.com

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