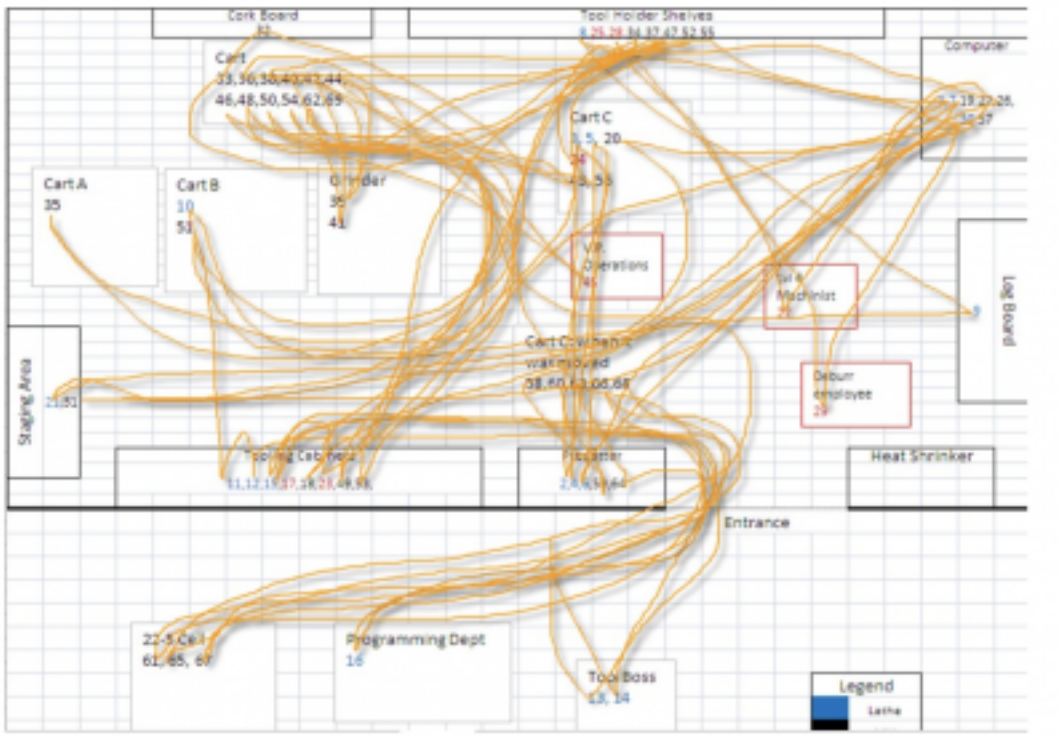
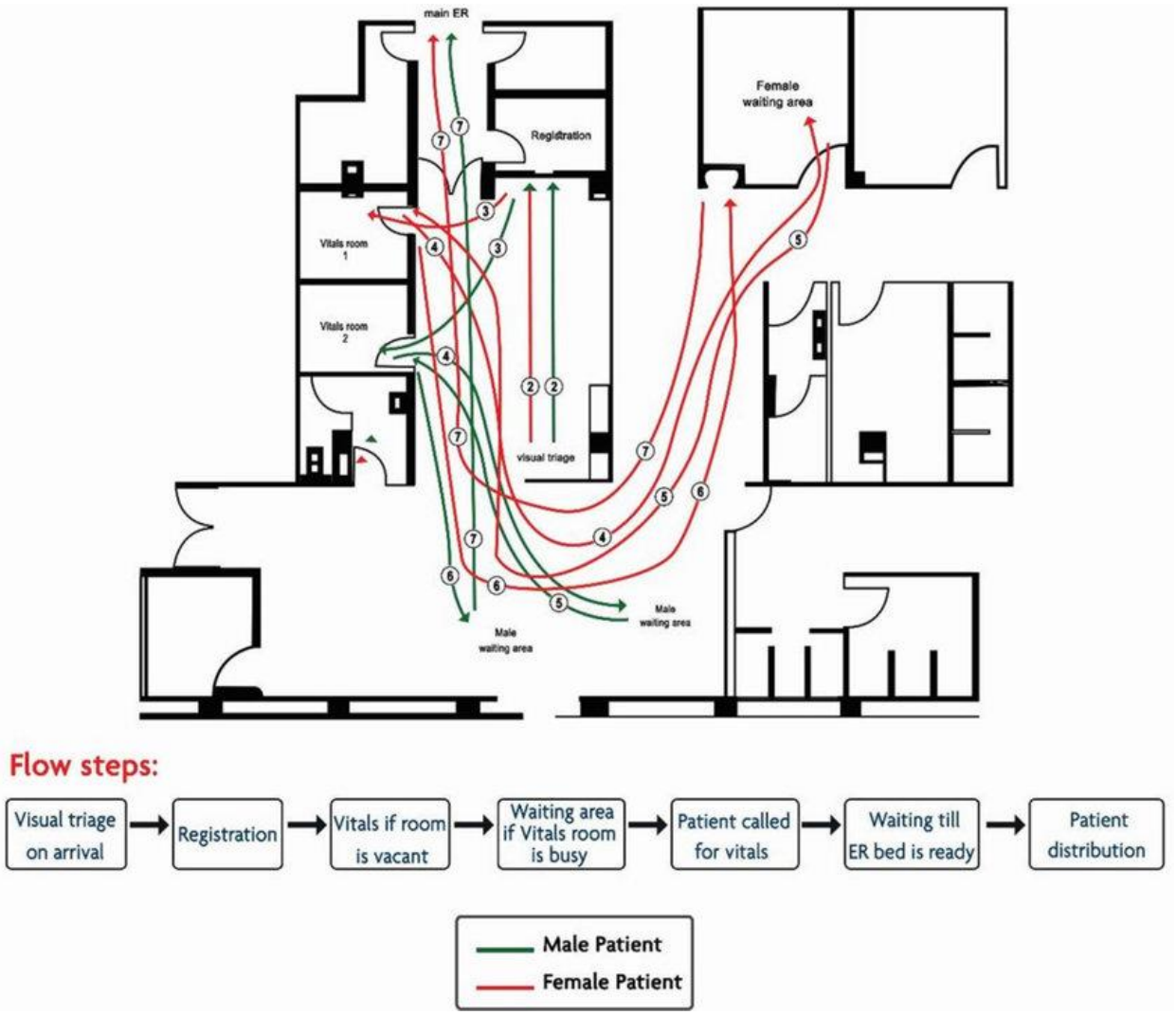
Study Guide: Spaghetti Diagram

What is a Spaghetti Diagram?



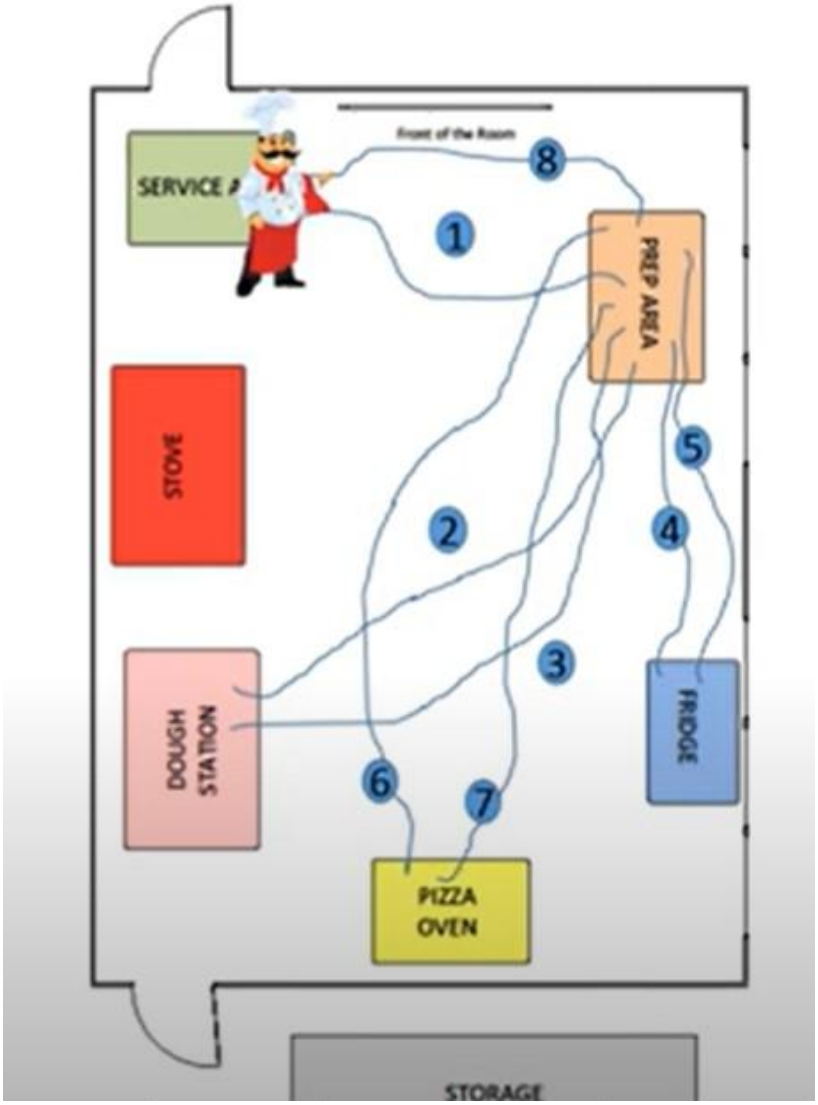
- A visual representation that documents the basic flow of people, paper, or products
- You begin with a layout of the space where the flow takes place
- You then record the actual flow lines using pencil and paper to draw on the space layout
- When all of the flow lines are recorded, they tend to resemble spaghetti, hence the term, “Spaghetti Diagram”

Why is the Spaghetti Diagram Important?



- The Spaghetti Diagram allows you to see wasteful movement and identify ways to reduce steps taken or move equipment to lessen the number of steps in a flow.
- This can include combining or eliminating steps in the process, moving equipment to a more centralized location, and changing room layouts when necessary.

Spaghetti Diagram Example. Current State



1. Cook takes ticket from service area to prep area
2. Leaves prep area and goes to dough station
3. Retrieves dough and returns to prep area
4. Leaves dough on counter and walks to fridge
5. Returns to prep area and adds pizza toppings
6. Places completed pizza in oven to bake
7. Gets pizza from oven and returns to prep area to prep the pizza
8. Leaves prep area and takes pizza to service area for customer delivery

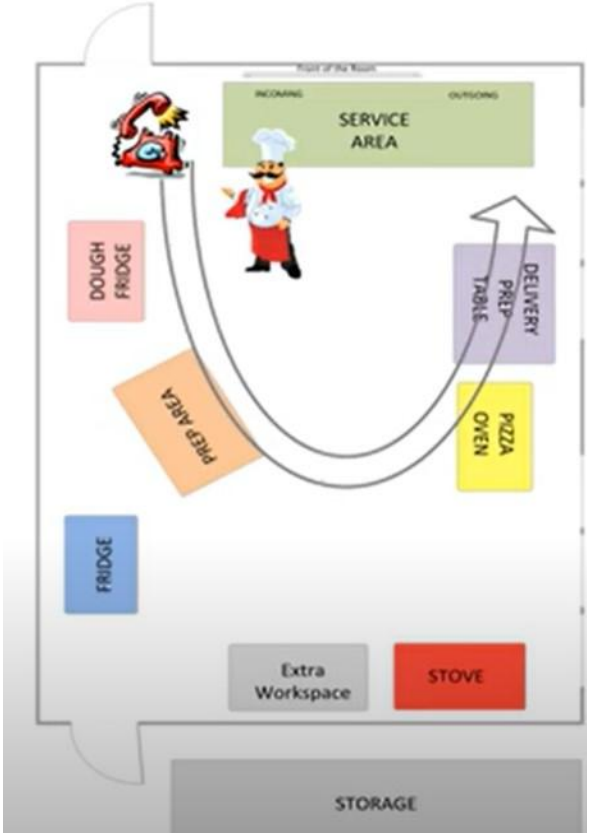
Tips and Best Practices for Layout Design

Basics to improve flow:

- Keep continuous flow concept as a focus when designing a new layout
- Make physical location of workstations and/or equipment correspond to work sequence
- Determine which staff has access to which equipment
- U-shaped or C-shaped (aka Cellular) designs are often most efficient in lean
- The cellular design eliminates waste by using a smaller floor plan
- Test layout designs to make sure they are working properly
- Establish pre and post measurements to document flow improvements
- Do not create a layout that cannot be changed

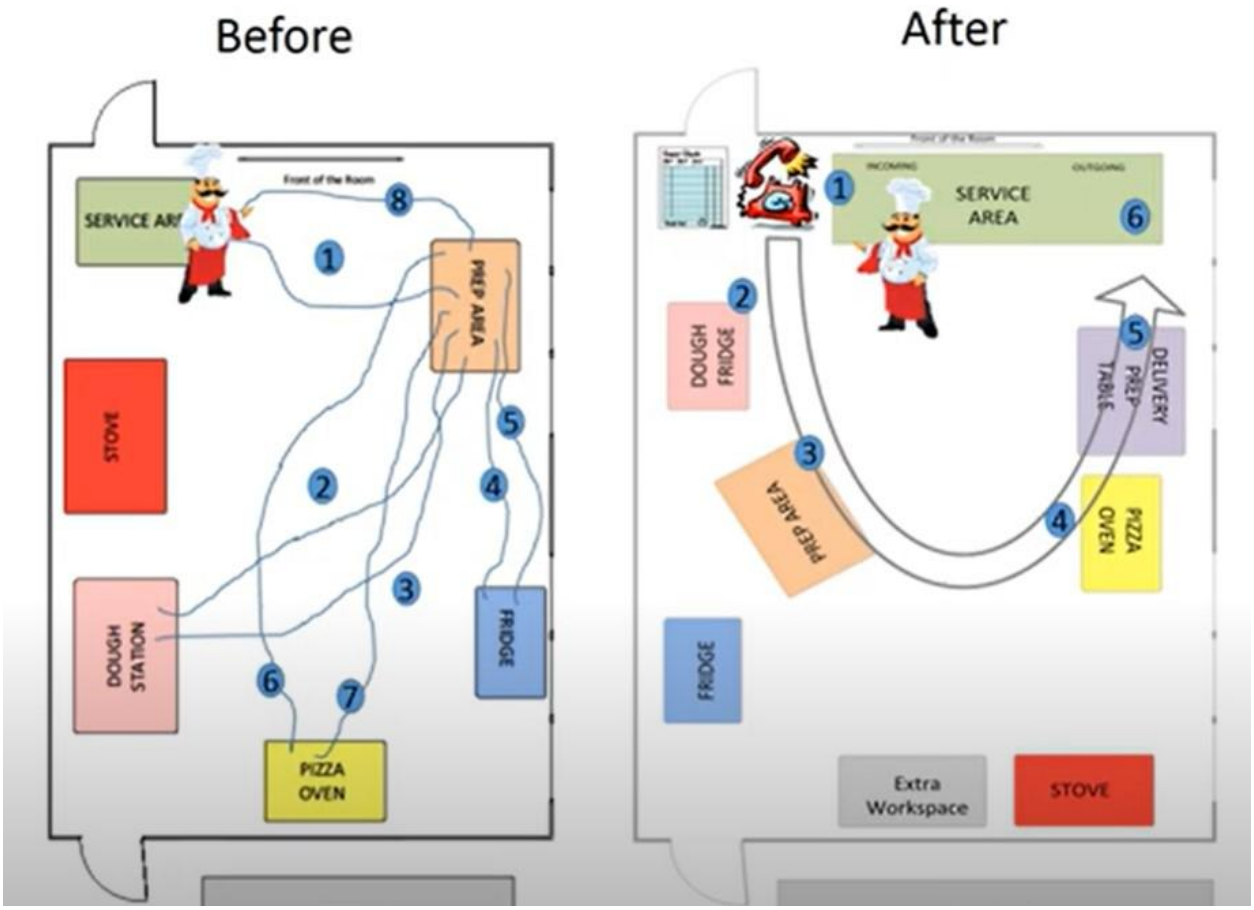
Spaghetti Diagram Application

End State of the pizza restaurant example

- **U-Shape Layout**
- 

1. The order is generated
2. Get the dough
3. Prep Pizza (coat with oil, add sauce, add toppings, etc)
4. Bake the pizza
5. Box or plate the pizza
6. Deliver the pizza to the customer

The process is now reduced to 6 workstations and 6 processing steps in a choreographed motion, thus improving flow with no backtracking.



Apply the Spaghetti Diagram to your work environment

- Where could you apply the Spaghetti Diagram to your work?
- Think of a current process you can walk through and visually document the flow to identify areas for improvement

Spaghetti diagrams are typically used in scenarios where you want to analyze and improve the flow and efficiency of processes, especially those involving physical

movement of people, materials, or items within a workspace. Here are some situations where using a spaghetti diagram can be beneficial:

- **Process Optimization:** When you're aiming to optimize a workflow or process to reduce waste, eliminate unnecessary movement, and enhance overall efficiency.
- **Identifying Bottlenecks:** If you suspect there are bottlenecks or congestion points within a process, a spaghetti diagram can help you visually identify these areas.
- **Layout Design:** When designing or redesigning a workspace or layout, a spaghetti diagram can provide insights into how to arrange equipment, workstations, and pathways to minimize unnecessary movement.
- **Reducing Travel Distances:** If employees or materials are traveling long distances within a process, a spaghetti diagram can help highlight these inefficient movements.
- **Lean Manufacturing:** In lean manufacturing practices, spaghetti diagrams can be used to support the principle of "value stream mapping," which involves identifying and eliminating non-value-added steps in a process.
- **Root Cause Analysis:** When investigating the causes of delays, errors, or inefficiencies in a process, a spaghetti diagram can help pinpoint where these issues originate.
- **Change Management:** Introducing changes to a process can lead to unintended consequences. A spaghetti diagram can help visualize the impact of changes on workflow and movement patterns.
- **Training and Orientation:** When onboarding new employees or training staff on processes, a spaghetti diagram can provide a clear visual guide to the flow of work.
- **Collaborative Problem-Solving:** Spaghetti diagrams can facilitate discussions and problem-solving sessions among team members, allowing everyone to see and understand process complexities.
- **Communication with Stakeholders:** When you need to communicate process inefficiencies or improvement initiatives to stakeholders, a spaghetti diagram provides a visually compelling way to convey the information.

In general, whenever you want to analyze and improve how people, materials, or items move within a process or workspace, a spaghetti diagram can be a valuable tool for gaining insights and driving positive changes.