Process & Step Metrics in a Value Stream Map (VSM)

Learning Objectives

At the end of this presentation, you will have a better understanding of:

- Transitioning your flow chart to a value stream map

- Understanding of the stages of the value stream

- Calculating process times

- Current states versus future states

Process Measures

- **Time Metrics**
  - Evaluate the time to deliver a service to customers, the portion of time that is spent processing, and if a customer is waiting.

- **Output Metrics**
  - Track the production or activity of agency processes; such as bags of food delivered, or lab tests conducted.

- **Process Complexity Metrics**
  - Describe the complications and nature of a process, such as the number of steps in a process, number of decision loops etc.

- **Step Measures**
  - Process measures that are focused on parts of a process and represent the work of individuals and teams – often ordinal (yes/no)
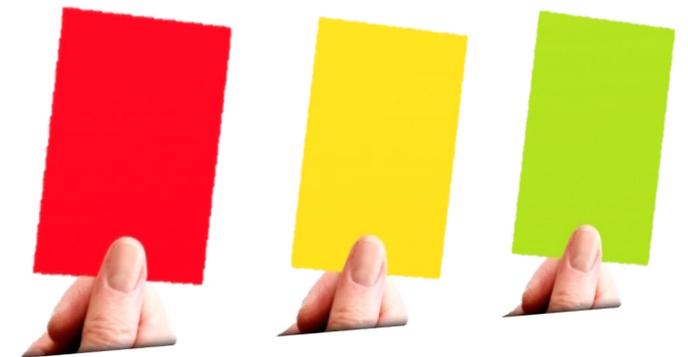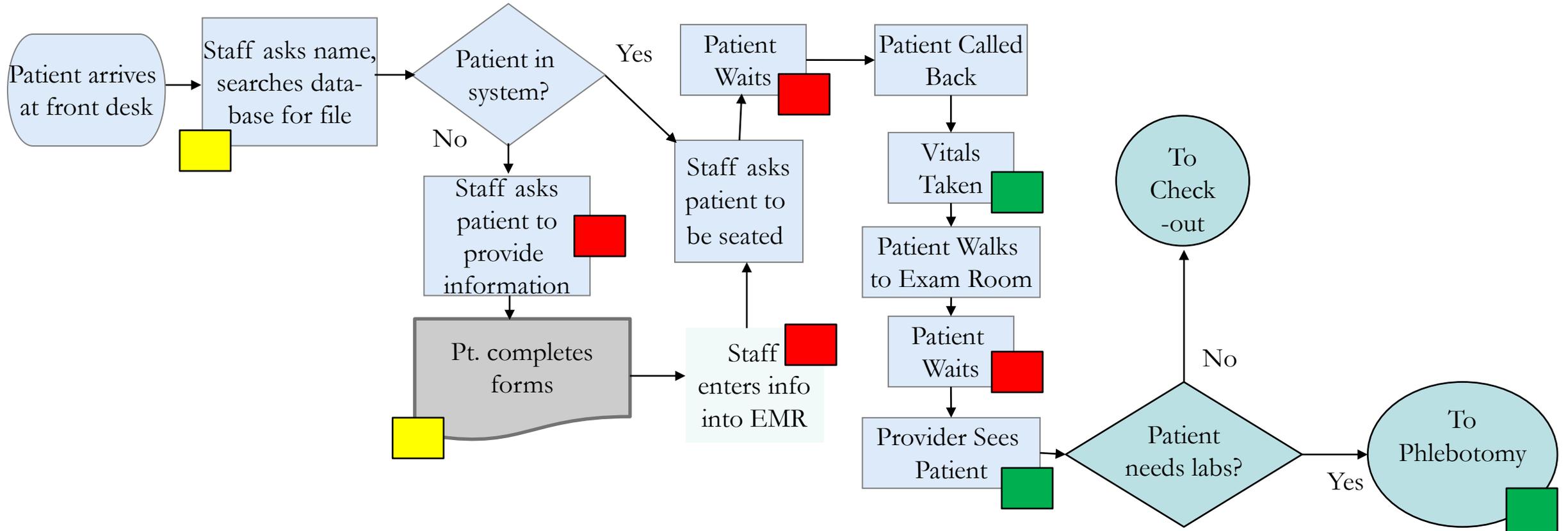
Value Stream Mapping: Data Boxes

➢ <u>Takt Time</u>: the amount of time it takes to complete the process to keep up with demand

- ▪ Ex: our takt to see each patient is 15 minutes

➢ <u>Cycle Time</u>: the amount of time it takes for the step

- ▪ Ex: Average time to get patients checked out at front desk

➢ <u>Lead Time</u>: Total time from initiation of process to end from customer perspective

- ▪ Ex: Average time of visit from patient walking in the door to walking out

➢ <u># of People</u>: the number of staff involved in the step

➢ <u>Inventory</u>: the number of patients or items "waiting"

- ▪ Ex: We've seen 20 pts. and have 10 waiting to be seen or currently in the process and we have 2 hours before the last slot. Ties into services-in-process and takt.

Beginners: Make an Existing Flowchart into a Value Stream Map

1. Take an existing flowchart or other process map
2. Gather a small team that has knowledge of the process
3. Talk through each step at a time
4. Use Sticky Notes and/or markers mark each step:
   - **Green Mark**– value added
   - **Yellow Mark** – requirement
   - **Red Mark** – non-value added
5. Assign each step accordingly – go for consensus
6. Brainstorm how to remove waste and add more value
   - Use quantitative process data to inform discussion
   - Use qualitative consumer data as well – compare to their map or journey map

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Ready for an Advacned VSM?

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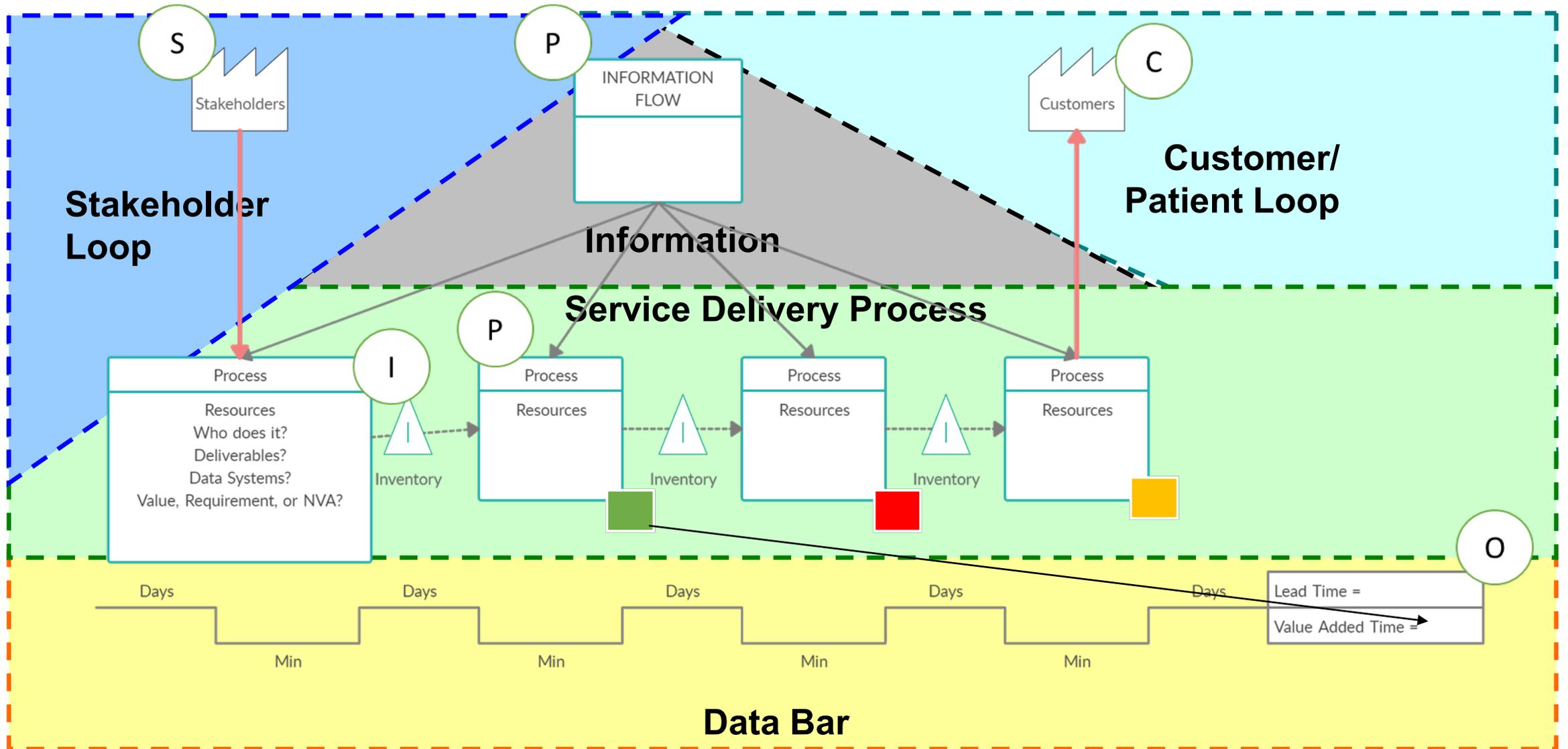
Before You Start the VSM

- Debrief on your preliminary findings from the Gemba Walk

- Get the team together with a couple hours to create the VSM
  - Be clear the purpose is to end the meeting with a current state map that is suitable for keeping the project moving forward

- Identify your boundaries--start/end points, the Product Family you want to map, and the Value Stream Manager/Mapper for that Family

- Gather the basic/key Information
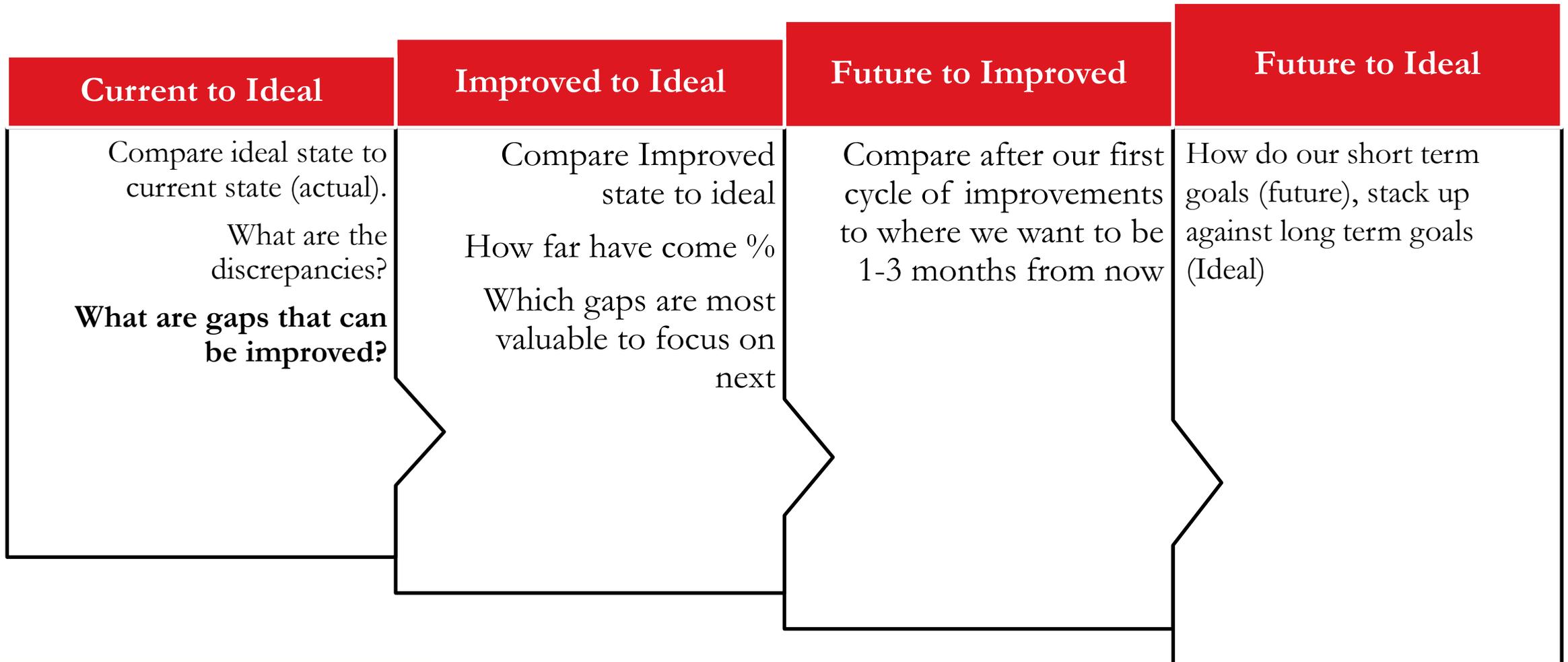 - (Consumer Needs, Process Measures, Stakeholders data, Inputs)

Making a Detailed Value Stream Map

➢ <u>Flip Charts</u>: three sheets; one for each map

➢ <u>Markers</u>: use to trace your pencil lines

➢ <u>Sticky Notes</u>: can create process steps, or be notes on the process

➢ <u>Squares</u>: process steps

   ▪ Color Code: red = non-value, orange/yellow = business value, green = value added)

     • Or use markers in the corner

➢ <u>Lined squares</u>: for data/metrics i.e. time

➢ <u>Triangles (cut squares diagonally)</u>: inputs

➢ <u>Arrows</u>: pull system

➢ <u>Stars</u>: kaizen opportunity for improvement

Anatomy of a VSM

Comparing VSM States

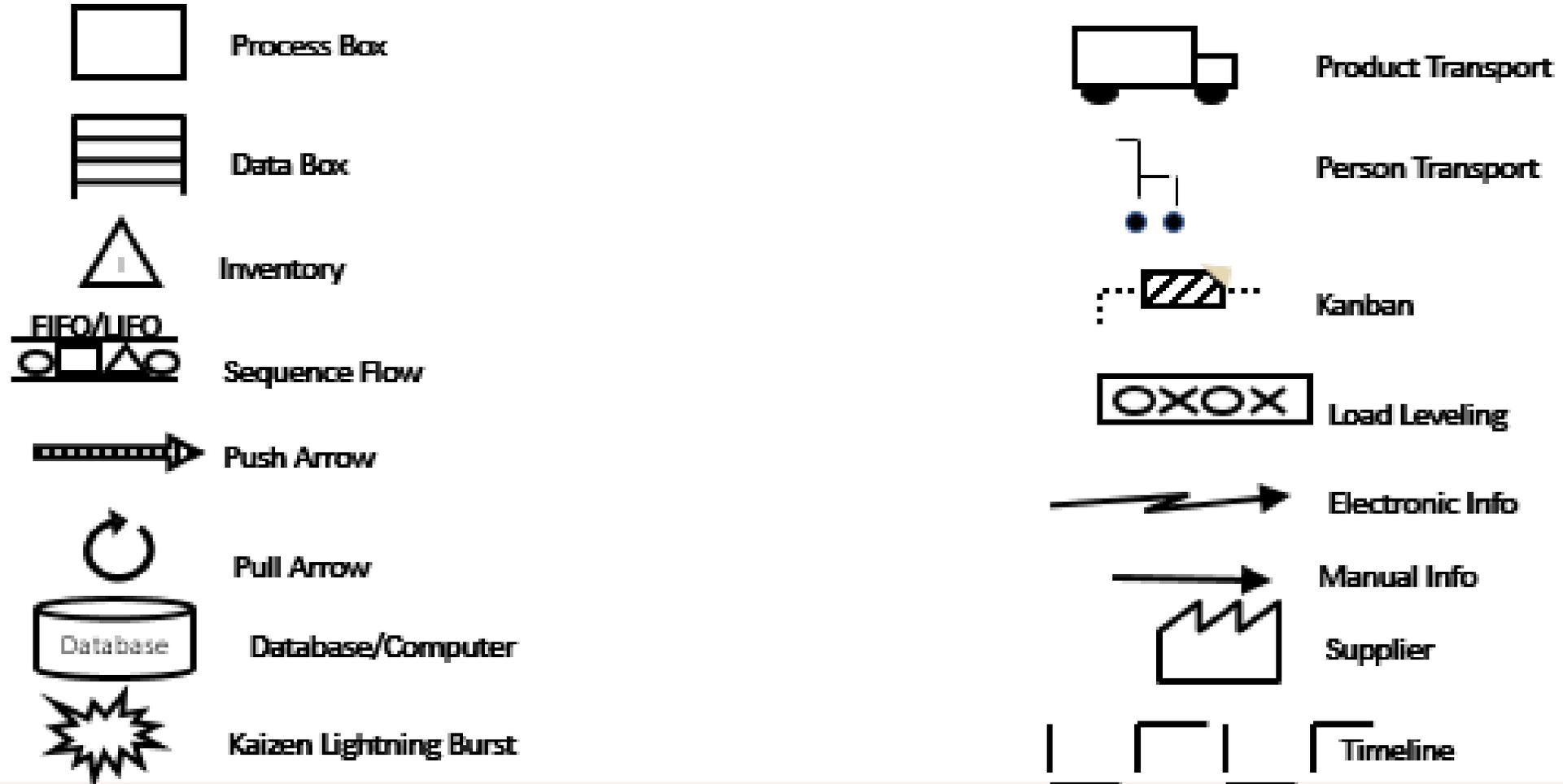| Current to Ideal	Improved to Ideal	Future to Improved	Future to Ideal
Compare ideal state to current state (actual). What are the discrepancies? **What are gaps that can be improved?**	Compare Improved state to ideal How far have come % Which gaps are most valuable to focus on next	Compare after our first cycle of improvements to where we want to be 1-3 months from now	How do our short term goals (future), stack up against long term goals (Ideal)

Creating the Current State Map

➢ Collect current state information from actually **walking along the actual pathway** of the patient and/or information

  ▪ Begin with a quick walk through along the entire scope using the gemba walk method

➢ Bring a stopwatch and do not rely on information you do not personally obtain. **Time is everything**

➢ One person or group collaboration creates the whole map. **Do not assign it in parts**
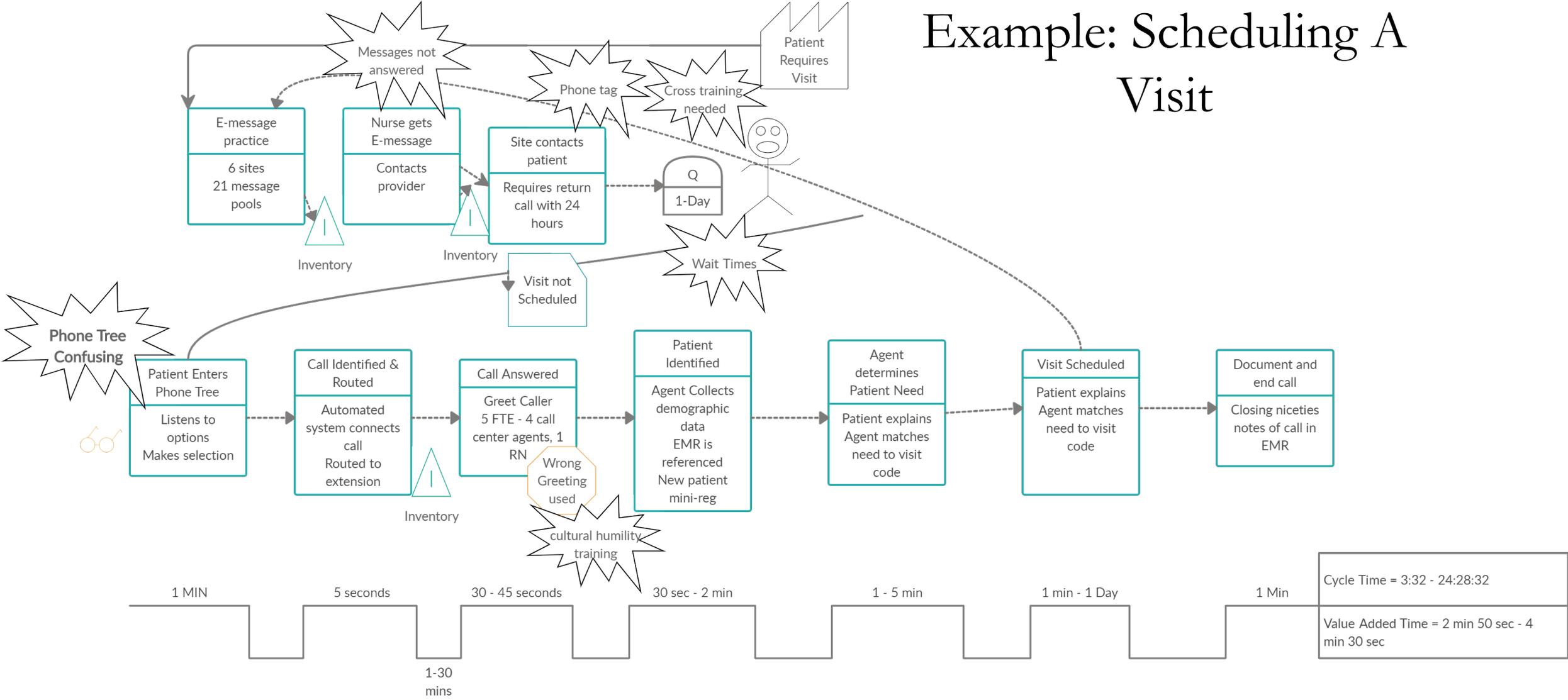
➢ Draw in pencil

Creating the Current State Map

- ✓ Identify the scope of the map for the initiative
  - ✓ Begin with a high-level map across departments/unit
  - ✓ Then focus on the level of processes or step that you wish to address
- ✓ Identify when the consumers requirements are met (success!!)
- ✓ Inform process owners that the map we be created from actually walking and get their input
- ✓ Agree on icons that will be used
- ✓ Keep it simple, but good enough

Value Stream Mapping: Common Icons

Process Box

Data Box

Inventory

FIFO/LIFO Sequence Flow

Push Arrow

Pull Arrow

Database Database/Computer

Kaizen Lightning Burst

Product Transport

Person Transport

Kanban

OXOX Load Leveling

Electronic Info

Manual Info

Supplier

Timeline

Some Tips

➢ Once overall map is sketched out:
- Verify accuracy by asking a representative of one or two departments depicted to check it over

➢ Ask questions to help you understand
- the goal of the process
- customer requirements of the process
- employee impressions of the process's ability to meet customer requirements
- typical/exceptional process steps

Process & Step Metrics in a VSM

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Analysis of VSM Data Boxes

- Performing detailed analysis of a VSM will help a project move from current state to future state.
  - Data analysis
    - Input data
    - Efficiency data – time
    - Output data
    - Outcome data
  - Experiential data
  - Tools to analyze data

Measuring Time

Some standardized measures to consider when looking a project where *time* (waiting, rework, customer value) is a critical to quality factor include:

- **Cycle time** - Time to complete a process or process step, excluding wait time
- **Takt time -** the amount of time it takes to complete the process to keep up with demand
- **Best and Worst Cycle time(s)** - measures variation, can be plotted on control chart
- **Wait time –** The process is not moving forward from the internal or external customer perspective
- **Percent of services delivered on schedule –** Looks at a % benchmark of time
- **Value Added Time Metrics** - the time spent that improves the outcome of a process

Takt Time Example:

Let's calculate the Takt time for patient visits based on the following scenario:

- We have 15 min schedules and we double book – 120 patients are on the schedule today
- We have 4 providers
- They each are scheduled in the clinic to see patients for 7 hours

what is our takt time?

TAKT TIME
(7hrs*60min*4 providers)= 1680 min

1680min/120pts= **14 min**

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Process Complexity

Process performance is often impacted by waste within the process. An important aim in improving or redesigning processes should be make them simple, streamlined, and efficient

- **Process Steps** - Total number of steps in a process where a task or activity is performed
- **Value Added Process Steps** - Number of process steps that add value from a customer's perspective
- **Decisions** - Number of points in process where a choice is made about a course of action
- **Delays** - Number of points in process where time is wasted by waiting for something to occur
- **Handoffs** - Number of times work is passes from one person, department, or system to another
- **Loops** - Number of times when there are a series of steps that loop backwards and repeat themselves at least once (rework)
- **Black Holes** – The process is full of extreme problems that cause it stop before it completes

Time & Value

- It can be difficult to quantify actual value while we're working on actual improvement cycles, since value is often captured in outcomes such as improved lab values, cost savings, and experience or satisfaction measures.
- By looking at time we get a good proxy for what adds value in the process
  - Value Added Time
    - Sum of all value-added time in a process.
  - Non-Value Added Time
    - not just wait time, sum of anything spent on NVA
  - Percent Value Added Time
    - Value added time/total lead time

Step Measures

Measures a <u>part</u> of the process. These steps are the places in the system where applying a change idea can result in improved performance.

- This is often where root causes are captured.
- This is often where variation in a process is detected
- This is where our projects can offer value adds to our customers
- They effectively measure your improvement cycles
  - Custom measures that show change quickly

Using an appropriate process map can help illuminate step measures that make sense

Using VSM to Make Improvements

VSM - Key Questions for Improvement

- What of the ideal state map can be implemented in **1-3 months**?

- Identify short term goals to improve:

  - **Timeliness –** can we remove wait time and non-value added time?

  - **Productivity –** can we create more outputs with the same inputs?

  - **Quality –** can we improve health outcomes, service delivery, and experience?

  - **Capacity –** can we serve more customers?

Example: Scheduling A Visit
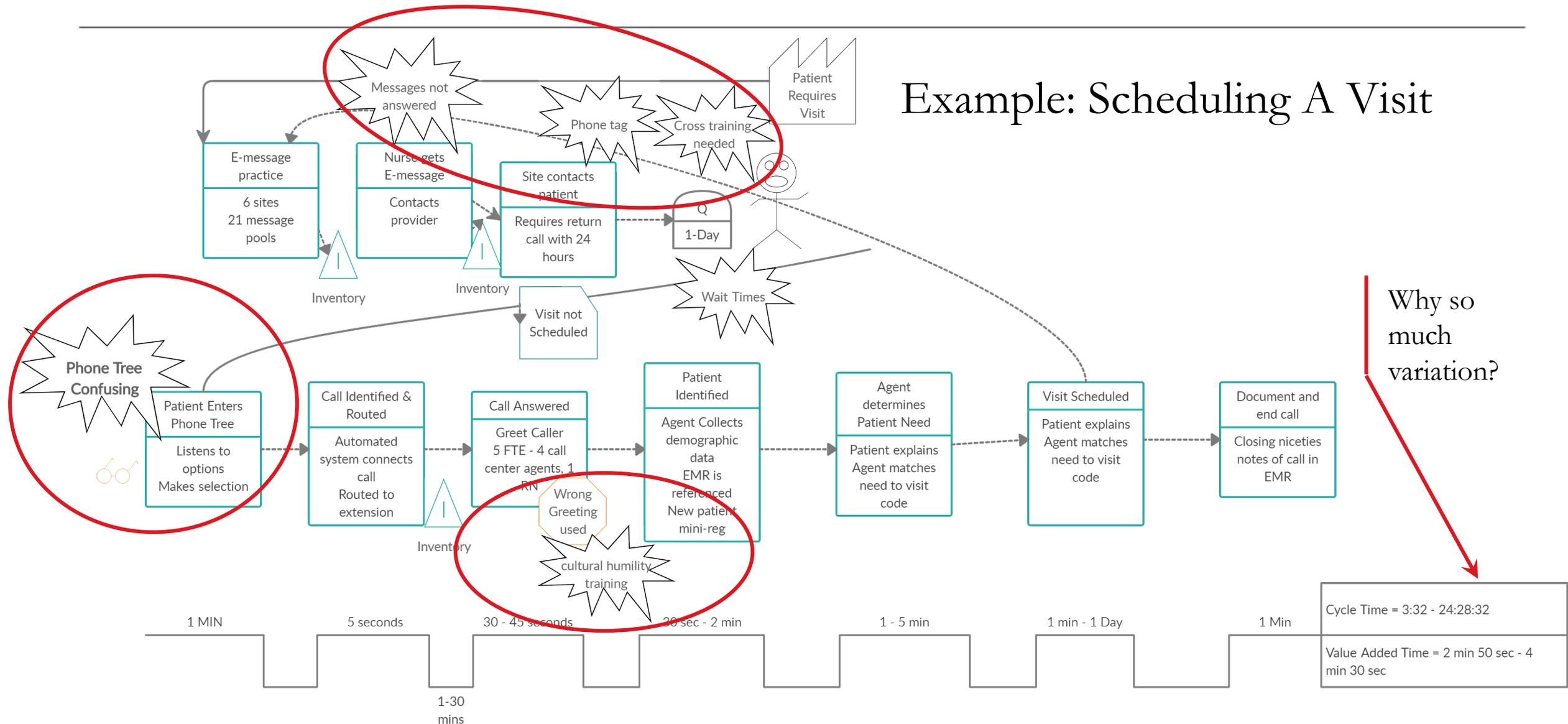
Process Analysis Questions

- How many staff are engaged per process step?

- How many consumers are in the system at a given time?

- Can the team identify lean wastes in the process (8 wastes, overburden, unevenness)?

- Can the variation between clients needs be measured?

- Where are the wait times?

Stakeholder Loop Questions

- Key question: how do you communicate to stakeholders what you need?

  - Resources

  - Information

  - Support

- What upstream processes affect our process being improved?

- Do we have a stakeholder training program?

  - Is there any cross-training?

  - Is there currently a clearly defined set of policies and procedures

    - Do they align with current service standards?

Information Questions

- How many services can we do at one time?

- How long does it take to go from customer demand to service initiation?

- How do we react to customer emergencies?

- Is their waste in our data systems?

Information Flow Questions

- How is the process handed off from one step to the next initiated?

  - Who is involved in the hand-off?

  - How frequently does a hand-off occur?

  - What is the process of communication?

    - Consider both stakeholders and customers

Create the Ideal State Map

- Assume that anything is (reasonably) possible
  - Our customers are satisfied
  - Our outcomes are good
  - High job satisfaction among all staff in the process
  - Resources are available, if needed
- Create an ideal state map
  - Map the physical flow of people and materials
  - Map the information flow or documents and data
  - Complete the lead time data bar
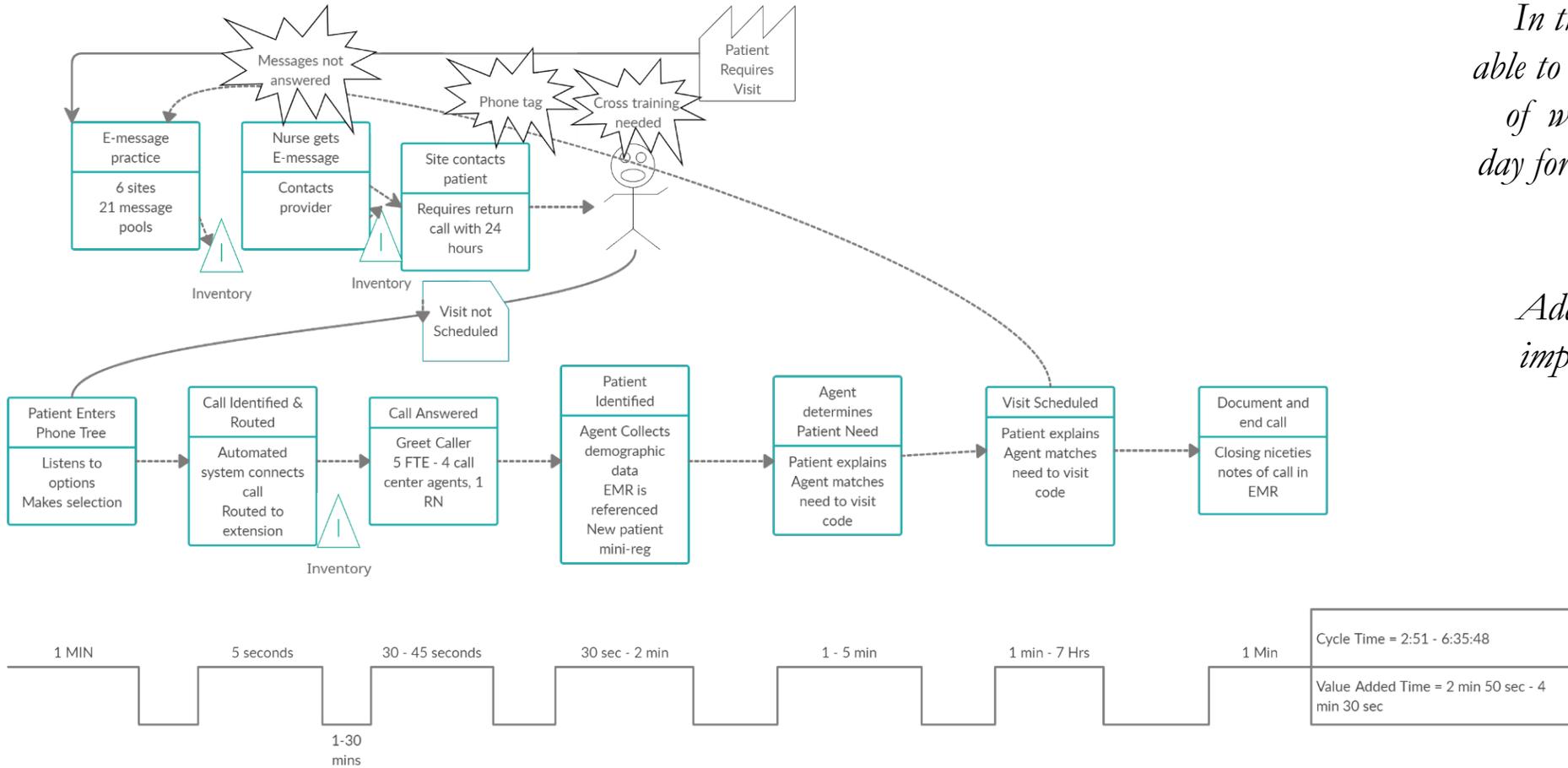
Same Example: Ideal State VSM
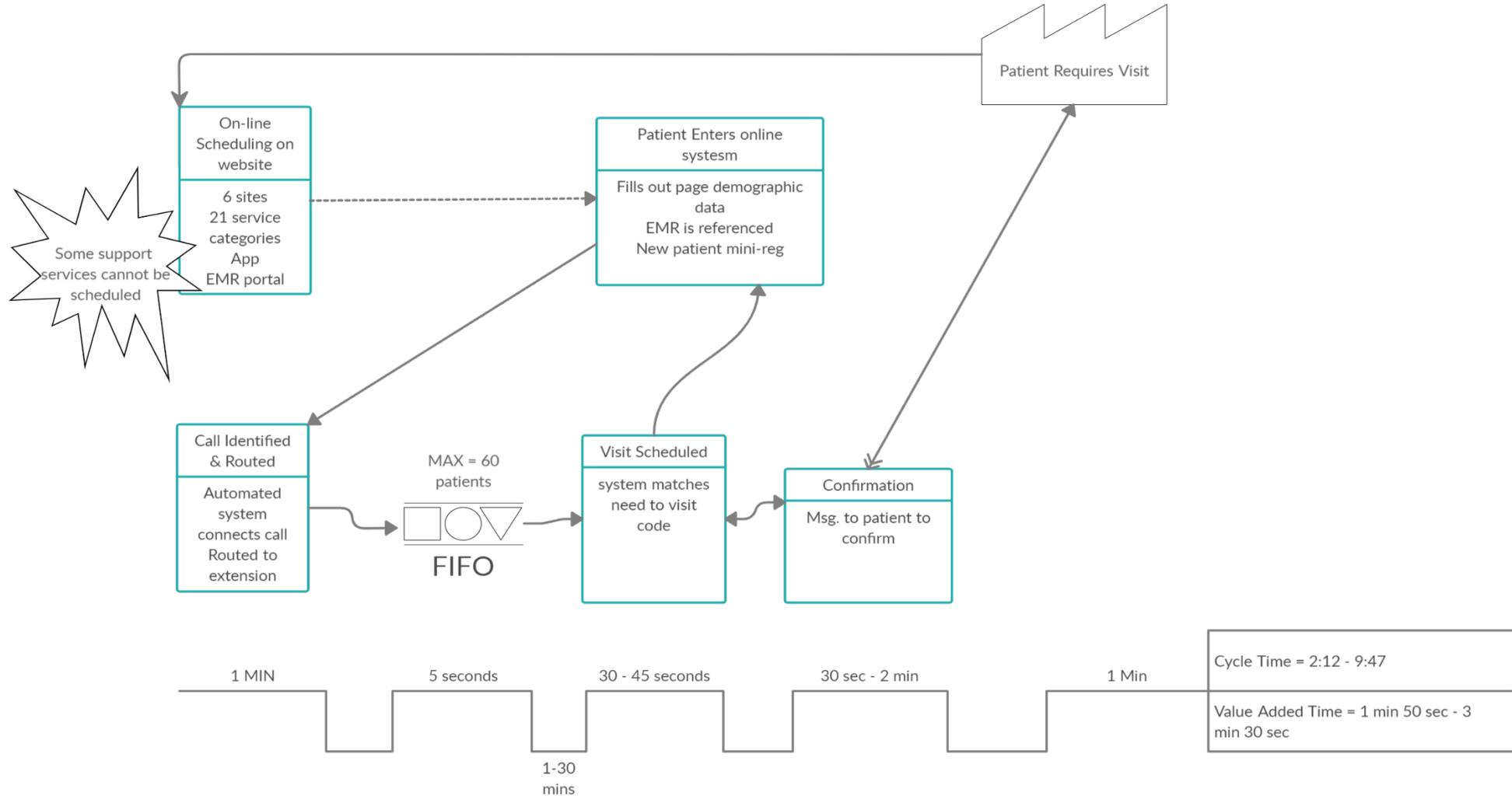
Documenting Changes

- Summarize key differences between current state and ideal state
  - What was learned from analysis
  - What is the anticipated outcome, how much better will we be (quantify)?
  - Description of the future state
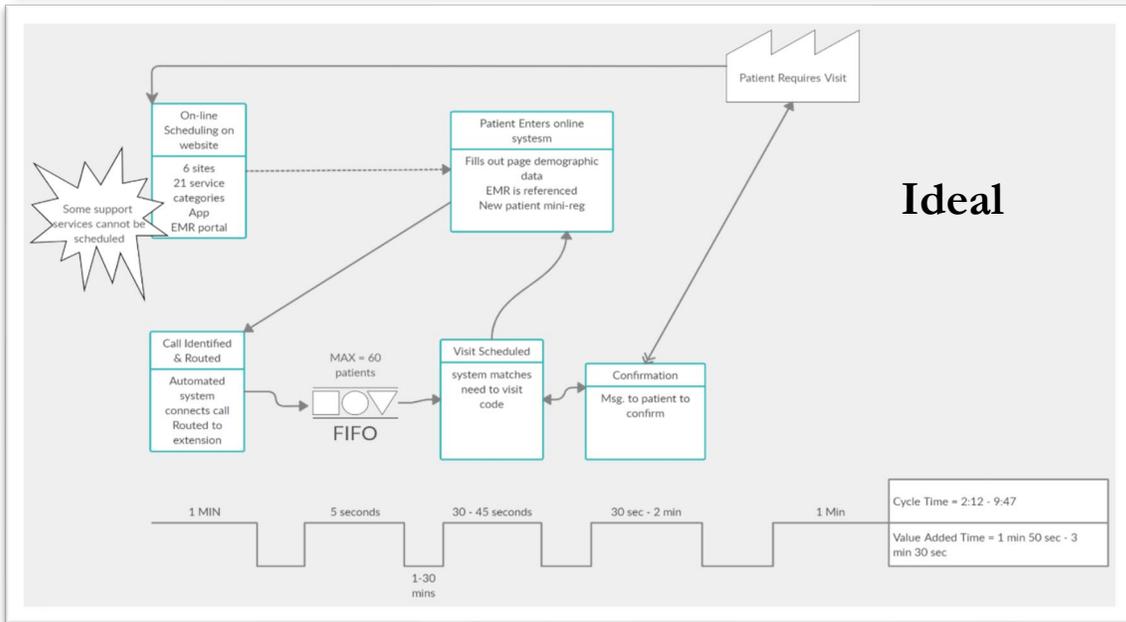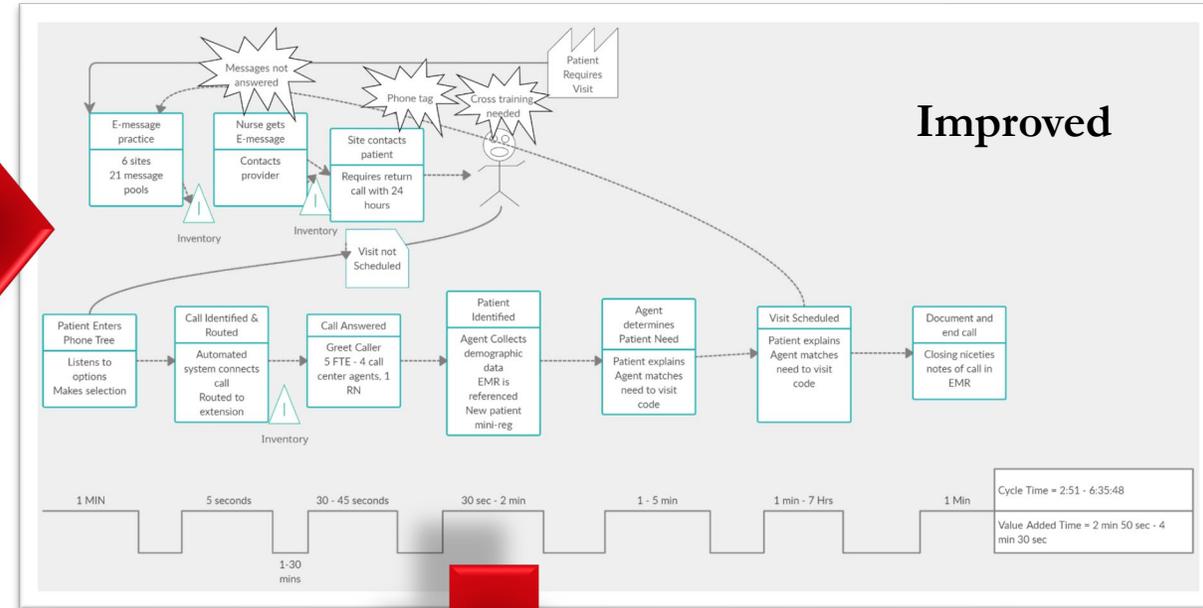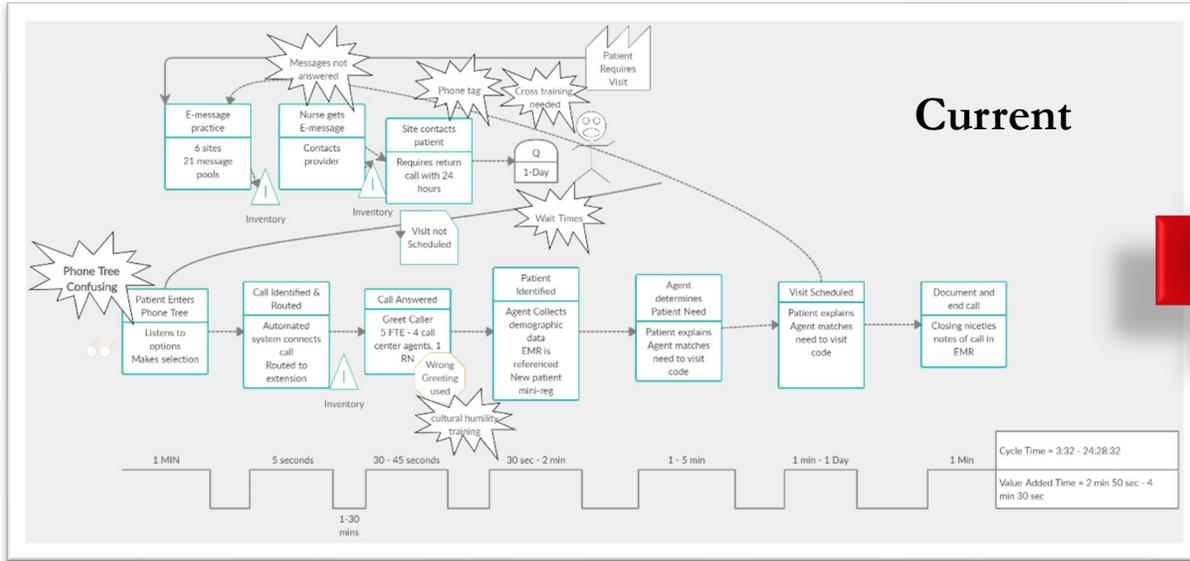 - Commitment needed to implement the action plan

Improved State

In the improved state we were able to eliminate the major waste of waiting up to do a business day for a return call to make an appointment.

Additionally, we were able to improve the phone tree menu, which improved customer experience

Gap Analysis: Reviewing Changes in State of the VSM

Future State Value Stream Map: Key Questions

1. How would the customer draw this map?
2. What would the ideal process look like?
3. Look for value added activities (usually the boxes) and seek to eliminate waste (arrows, forms, decisions, rework, transport etc.)
4. What improvements could be made if there were **no** constraints on scope or resources?
5. Where is continuous flow most important?
6. Where could we employ a creative idea to remove waste?
7. Which improvements will give us the most juice for the squeeze? (intersection of high impact, high probability, low cost solutions)
8. Which improvements will best help the process owners sustain?

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Putting it all Together:

- Don't jump right to solutions from outcomes or experiences that need improving.
  - Problems are found in systems, processes, and steps
  - Problems can often be identified by constraints in flow.
- Mapping a Process is a great way to understand the throughput from beginning to the desired end
- Actually walking the process and talking to process experts is the best way to create a process map accurate enough for improvement
- Creating a value stream map will provide many advantages for data informed process improvement such as:
  - Strategic project planning and reporting
  - Aligning improvements with the strategic initiatives and program plans
  - Sustainability (visual aids for training on a process)
  - Explaining procedures and CQM improvements to customers and stakeholders
  - Communicating changes across silos
  - Initiating new policies and updating policy manuals

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Improvement = Change

Change ≠ Improvement

Changes should be informed by data about a clearly defined process, and reflect rational changes to that process which address the root cause of problems.

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Summary

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