

# **MANAGEMENT-LED PARTICIPATIVE CONTINUOUS PROCESS IMPROVEMENT**

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## **ABSTRACT**

Continuous process improvement is one of the foundations for any Lean or Six-Sigma implementation. This typically requires to find and maintain solutions to problems and to achieve this, a precise understanding of the system state is required. Implementing solutions without assessing the system state, can risk the whole Lean or Six Sigma program. Continuous process improvement is exercised at every level of organization with the assist of a variety of tools. Jishuken one of such continuous process improvement tools, which uses cross-organizational and cross-functional teams to tackle a broad range of process improvements (from operational level to strategic level). Jishuken is adept at handling, according to the Cynefin framework, system states where the cause and effect relationship is evident (ordered) and within a unanimous team environment (unitary). However, Jishuken does not offer any guidance to handle system states wherein the cause and effect relationship may not be evident (unordered) and/or the team environment may not be unanimous (pluralistic). This research uses a complementary approach to enhance Jishuken's capabilities with Cynefin framework. As a result, six system states are proposed, and their accompanying operational definitions are provided. This results in a conceptual model that offers flexibility to Jishuken process practitioners to operate in different system states.

Keywords: Continuous Process Improvement, Lean Manufacturing, Cynefin Framework, Nominal Group Technique, System of System's Methodologies, Kaizen

## **INTRODUCTION**

Continuous process improvement has been an important tool for Lean and Six-Sigma initiatives. Typical Lean organizations encourage daily problem-solving activities for every deviation observed at all levels of organization, and thus facilitate continuous process improvement. Some of the organizations on Lean journey measure the number of kaizen events held to gauge the Lean activity level in their organization. These events act as a quick and aggressive way to improve a process by identifying and removing waste (Liker & Hoseus, 2008).

Ideally, continuous improvement should not be limited to small changes made at shop floor level, but it should be exercised at every level incorporating broad range of problems from system level big changes to small changes at shop floor (Liker & Hoseus, 2008). An ideal Lean organization is one where continuous improvement is exercised at every level of organization depending upon the roles and requirement, and where every employee at every level is constantly looking for opportunities to improve the process with respect to their job duties.

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Problems solved through continuous process improvement at every level of an organization are different. This means that problems gain complexity the higher they are encountered along the organization's hierarchy (see table 1).

**Table 1. Types of Problem Solving for Continuous Process Improvement at Different Levels** (Liker and Hoseus (2008), French et. al (2009), Jaques (1989))

<b>Job Classification</b>	<b>Types of problems solved</b>
Department Head	Business planning problems (Strategic level)
Manager- Asst. Manager	Process performance problems (Tactical level)
Group Leader	Operations Management problems (Operational level)
Team member	Individual process problems (Operational level)

The implication of table 1 is that not all problem-solving tools and methods are equally effective at all organizational levels. If we consider the 8-step problem solving method, we find two tools associated with it: A3 form and Jishuken. In this case, the A3 form works best at the operational level, while Jishuken is better suited for tactical and strategic levels. This is true because the A3 form was designed to assist operational level problem solving while Jishuken was designed to assist tactical and strategic level problem solving.

### **Jishuken Process**

Jishuken is a similar group continuous process improvement, which involves a management led cross-functional and cross-organizational team; thus, making it capable of solving a broader range of problems. Most of the literature tries to define Jishuken as a management led kaizen blitz model where a cross-functional team is dedicated to improving target working areas radically with specific goals and within 5 to 6 days (Montabon, 1997; Liker & Meier, 2006; Farris, Van Aken, Doolen, & Worley, 2008). While Marksberry et. al (2010) observes that, the drive for Jishuken is two fold, first is to solve the problems and improve processes that needs management's attention and second is to provide a learning opportunity and to deepen the understanding of Lean culture in the employees.

### **Jishuken Team**

Even though the procedure does not mention any specific number of members required to exercise Jihuken, Marksberry et. al (2008) states that the number of team members should be based upon the requirement of the problem. Further, it also states that Jishuken team members should be chosen from the concerned area which needs improvement and people from downstream and upstream departments can also contribute.

Any Jishuken team consist of three types of memebers, team leaders, facilitator and team memebers their functions are discussed in Markberry et. al (2008) we are summarizing them below

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**Table 2. Roles Functions and Responsibilities of Jishuken Team Members**

<b>Role</b>	<b>Functions and Responsibilities</b>
Team leader	Decision making; selecting the countermeasure; providing ideas and opinions regarding the countermeasures; setting goals and targets Team leader has the responsibility to implement countermeasures and also has final say in selecting a countermeasure and team members have to support the decision.
Facilitator	Formulating team; guiding team through structured process; ensuring team participation; Facilitator is responsible to train employees and manage interpersonal dynamics of the team.
Other Team Members	Share opinions and ideas for developing countermeasures Along with contributing to problem solving procedure team members are also responsible for co-ordinating, tracking and distributing information.

## **Implementing Jishuken**

According to Marksberry et. al (2010) and Liker & Hoseus (2008), Jishuken process can be implemented in the following scenarios:

- To establish new standard
- Attain a standard
- Maintain a standard

Implementing Jishuken offers an opportunity to learn how to be better teachers while providing a common language and a common approach to problem solving standard across the organization (Hall, 2006; Marksberry, Badurdeen, Gregoy, & Kreaflle, 2010). This common approach was developed by engineers at Toyota (Montabon, 1997), and it is common across every kaizen process for problem solving. The eight step has been rephrased and discussed in detail in various articles and books such as (Ohno, 1988; Liker & Hoseus, 2008; Marksberry, Badurdeen, Gregoy, & Kreaflle, 2010). The eight steps are as follows:

1. Clarify the problem
2. Break down the problem
3. Target setting
4. Analyze the root cause
5. Developing Countermeasures
6. Implementing Countermeasures
7. Monitoring the process
8. Standardizing successful practices.

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## **Inadequacies of Jishuken's 8-Step Problem Solving Approach**

Inadequacies of this eight-step problem solving approach in Jishuken are discussed in Joshi et al (2017). Inadequacies of such approach to Jishuken, are categorized into two facets, first is the pluralistic environment that could be present in Jishuken group and second is this eight-step problem solving approach is ill-equipped to solve strategic level problems.

First, Jishuken is performed at an early stage of Lean implementation with an intention to teach managers, employees and line workers values and a common approach to solve problems. As Jishuken consists of a cross functional team, it runs a risk of becoming a top down controlling process rather than a team process (Marksberry, Badurdeen, Gregoy, & Krefle, 2010). With an authoritarian approach it can make adoption of Lean and kaizen events difficult among the employees of the organization.

Secondly, as explained previously, Jishuken is also capable of strategy level process improvements. Involvement of subordinates in such decision not only helps in finding innovative solutions and countermeasures but can also build an environment of trust, further deepening and enriching the Lean manufacturing's core values of trust, respect and team work. Problems that are solved in strategy level process improvement are placed in complex domain (French, Cynefin, statistics and decision analysis, 2013) of Cynefin Framework (Kurtz and Snowden, 2003) (elaborated later in the article), where the cause and effect relationship is not evident and in such case it is important to find an emergent solution from experiments rather than trying to analyze and find root cause. The current eight step problem solving methodology used in Jishuken has a 'one fit for all' approach and thus can fall short to make decisions in complex domain as this more of a trial and error domain.

## **SYSTEM STATES FOR JISHUKEN**

In this research, system state contains environment of Jishuken team and the problem Jishuken team is trying to solve. Therefore, two aspects can describe a system state for any Jishuken team which are:

- Participants' relationship in Jishuken team
- Type of problem Jishuken tries to solve

Based on the discussions above, to visualize and discover the potential system states in which a Jishuken can operate we can take the help of System of system's methodologies and Cynefin framework.

### **Participants' Relationship in a Jishuken Team**

In this research, system of system's methodologies is used to understand and discover different type of participant relationships that can exist in a Jishuken group. The system of system's methodologies (Flood & Jackson, 1991) classifies the participant's relationship as Unitary, Pluralist and coercive.

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**Table 3. Types of Team Relationship and Their Characteristics** (adapted from Flood & Jackson, 1991)

Type of Relationship	Characteristics
Unitary	<ul style="list-style-type: none"> <li>• Team members' values and beliefs are highly compatible</li> <li>• Team members largely agree upon ends and means</li> <li>• Team members' act in accordance with the agreed objectives</li> </ul>
Pluralistic	<ul style="list-style-type: none"> <li>• Team members' values and beliefs diverge up to some extent</li> <li>• Team members do not necessarily agree upon both ends and means but a compromise is possible</li> <li>• Team members' act in accordance with agreed objectives</li> </ul>
Coercive	<ul style="list-style-type: none"> <li>• Team members' values and beliefs are likely to conflict</li> <li>• Team members' do not agree upon ends and means and a compromise is not possible</li> <li>• Team members cannot agree upon objectives in present systemic arrangements</li> </ul>

### Type of Problem Jishuken Tries to Solve

This research uses Cynefin framework (Kurtz and Snowden, 2003) to understand and discover different domains a problem pertaining to Jishuken can lie in. Cynefin framework has four main domains which are Simple, Complicated, Complex, and Chaotic. Table 4 contains a description for each domain pertaining to the Jishuken process and decision model in each domain based on the works of Cynthia Kurtz, David Snowden and Mary Boone (2003, 2007)

**Table 4. Cynefin Framework Pertaining to Jishuken**

Cynefin Domain	Characteristics
SIMPLE	<ul style="list-style-type: none"> <li>• Situations and problems are said to be in simple domain when the cause and effect relationship is present and obvious to everyone. This is a domain where solutions to the problems are self-evident and agreed upon by everyone.</li> <li>• When tackling problems from simple domain it is advised to choose evidence-based approach, as in this domain problems have tested and proven structured techniques and processes to solve them</li> <li>• Decision Model : 'Sense – Categorize – Respond'</li> <li>• Problems in this domain have obvious solutions and does not need management's attention to solve such problems. These problems can be solved in daily kaizen events and usually does not require to setup Jishuken team.</li> </ul>

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**Table 4. Cynefin Framework Pertaining to Jishuken**

Cynefin Domain	Characteristics
COMPLICATED	<ul style="list-style-type: none"> <li>• Problems are said to be in Complicated domain when the cause and effect relationship pertaining to the problem is present but not evident to everyone. In this domain a subject matter expert can see the cause and effect relationship and therefore is able to predict outcomes.</li> <li>• Non-experts may need to spend time on the analysis of the problem to find cause and effect relationship.</li> <li>• Problem in this domain can have multiple right solutions</li> <li>• Decision model: ‘Sense – Analyze – Respond’</li> <li>• Jishuken team setup to pursue the purposes of maintaining or attaining a standard can classify their problems in this domain. Subject matter experts can identify root causes and can also suggest countermeasures.</li> <li>• A Jishuken team set to pursue the purpose of establishing a standard can also classify its problem in this domain if such a standard has been established and maintained before thus knowledge about such problems is available and can be understood by experts.</li> </ul>
COMPLEX	<ul style="list-style-type: none"> <li>• Problems in this domain said to have a cause and effect relationship but it is only evident in retrospect. One cannot predict the outcomes of countermeasures in this domain.</li> <li>• In Complex domain, the number of elements involved and the interactions between them is hard to determine and simulate and thus it beneficial to take the approach of finding an approximate or good enough solution instead of trying to find a perfect or exact solution.</li> <li>• Decision Model: ‘Probe – Sense – Respond’</li> <li>• Jishuken team set up to pursue the purpose of establishing a standard can classify its problem in this domain, if such a standard has never been achieved and maintained and no knowledge about such standard exists.</li> <li>• This is a domain of experimentation and it is suggested that Jishuken team perform safe to fail experiments to understand the cause and effect relationship.</li> </ul>
CHAOTIC	<ul style="list-style-type: none"> <li>• Problems in this domain may or may not have any cause and effect relationship and even if it is present there is no time available to do experimentation to try to understand it.</li> <li>• Situation is incomprehensible and demands a quick and decisive action to change the systemic arrangement. It is advisable to have a quick and authoritative intervention in such problems to bring stability to the turbulent environment.</li> <li>• Decision Model: ‘Act – Sense – Respond’</li> </ul>

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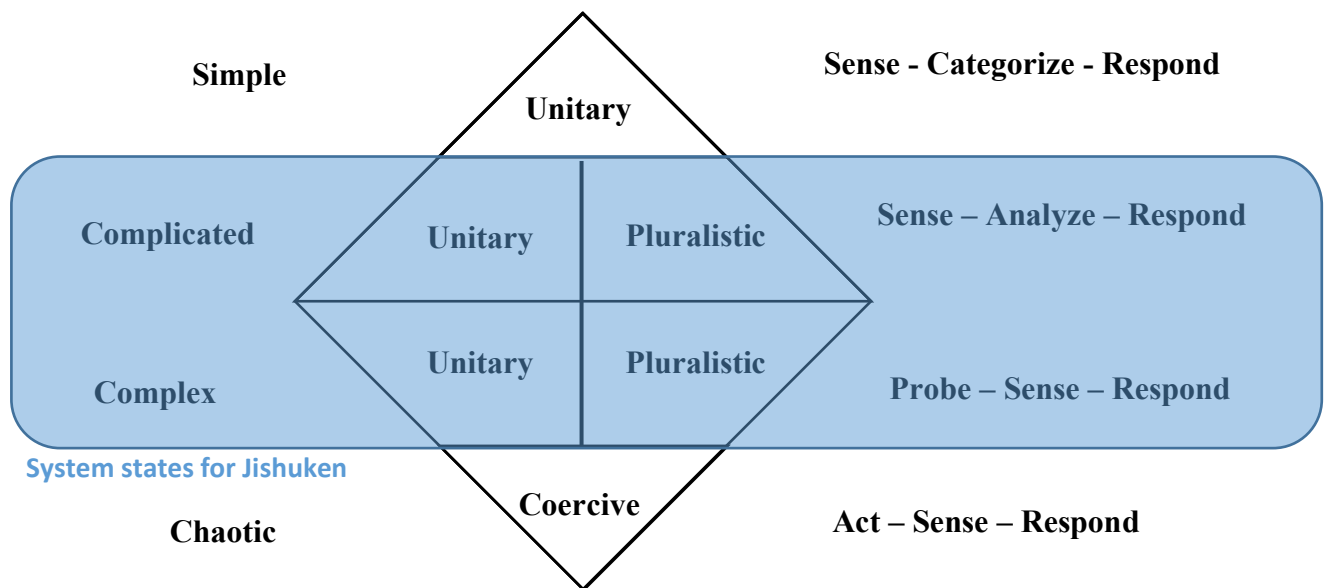
**Table 4. Cynefin Framework Pertaining to Jishuken**

Cynefin Domain	Characteristics
	<ul style="list-style-type: none"> <li>• Even though problems in this domain demands higher level management’s attention, but it does not require to set up a Jishuken team to resolve this issue.</li> <li>• Problems in this domain requires an immediate and authoritative intervention by higher management to contain the situation first. Once the situation is stabled by an intervention by management (i.e, problem is in complex domain), perhaps one can try to understand the cause and effect relationship by setting up a Jishuken team.</li> </ul>

## Visualization of System States

By combining these two facets a two-dimensional model is created, which consists of six domains. Figure (1) provides this model of different system states based on the two-dimension discussed above.

To understand and discover each system state pertaining to its relevance with Jishuken process, operational definitions are provided for all six domains. Every domain in this model demands a different approach to solve problems. Operational definitions can help Jishuken facilitator to understand where the problem he/she is trying to solve lies in and therefore, making him/her capable to select an appropriate approach.



**Figure 1. System States and Decision Models**

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The following table gives an operational definition and a description for each system state

**Table 5. Operational Definition and Description for each System State**

System State	Operational Definition and Description
<i>Simple Unitary</i>	Operational Definition: A perceived system state which has small number of known elements with few known interactions between them which are visible to every group member and thus making solution perceivable and predictable
	Description: In simple domain problems, the solutions are very obvious and are well understood by everyone. Therefore, pluralism cannot exist in such domain. These types of problem do not need management's attention and can be handled by low level continuous process improvement groups.
<i>Complicated Unitary</i>	Operational Definition: A perceived system state that has small number of elements, which are agreed upon by every group member but the interaction between the elements is not visible to every group member. These interactions are discoverable through analysis. Every group member can agree upon the solution.
	Description: Here the solutions are not straightforward and are not obvious to everyone, to derive solutions to the problems in this domain require in-depth analysis. Jishuken group with a purpose of attaining a standard or maintaining a standard will have problems from this domain. A Jishuken group with a purpose of establishing a standard can also find their problems in this domain if such problem has been dealt before and knowledge about such a case exists. The solutions to the problem can be agreed upon by everyone and does not need any marginalization of anyone. With time and resources problems in this domain can be moved to Simple Unitary domain.
<i>Complicated Pluralistic</i>	Operational Definition: A perceived system state, which has a small number of elements, which are agreed upon by every group member but interactions between them, are not visible but are discoverable through analysis. However, the solution for the problem is disputed.
	Description: This domain is similar to Complicated Unitary except the fact that the solutions are not agreed upon by everyone and requires a compromise. As values and beliefs of people involved in this group are not completely opposite, an agreed upon solution can be found through mediation.



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**Table 5. Operational Definition and Description for each System State**

System State	Operational Definition and Description
<i>Complex Unitary</i>	<p>Operational Definition: A perceived system state, which has a large number of known and unknown elements that are agreed upon by group members but the interaction between the elements, is not visible or predictable. Thus, a large number of solutions can emerge from group members</p>
	<p>Description: In this domain, the number of variables involved and the number of interactions between them is too high to predict an outcome of a possible intervention. This is a trial and error domain where the suitable approach is to design safe to fail experiments to gain more knowledge of the variables and the interaction between them. The participants of this domain have highly compatible values and beliefs therefore such a Jishuken group can reach largely agreed upon solutions. Jishuken groups trying to pursue the purpose of establishing a standard can find their problems in this domain. If that standard has never been implemented before and knowledge about such a case does not exist.</p>
<i>Complex Pluralistic</i>	<p>Operational Definition: A perceived system state, which has a large number of known and unknown elements, which are not agreed upon by group members and the interaction between the elements is not visible or predictable to anyone. Diverse and often competing solutions emerge from group members, which are not necessarily, agreed upon.</p>
	<p>Description: This domain is similar to Complex Unitary domain the difference being that Jishuken group members' values and beliefs diverge to an extent and even though they agree upon the ends they do not agree upon the means of achieving the ends and requires a compromise. The compromise is achievable and agreed upon solutions can be obtained through mediation.</p>
<i>Chaotic Coercive</i>	<p>Operational Definition: A perceived system state, which has large number of unknown elements with large number of undiscoverable interactions between them, thus making solution impossible to predict and perceive. Where the leader has to coerce others to accept the solution.</p>
	<p>Description: Participants have completely diverging values and beliefs and therefore agreed upon solutions cannot be achieved. The problems in this domain are very turbulent in nature. Therefore, problems in this domain require management's immediate attention and authoritative interventions to change the systemic arrangements.</p>

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## ADDRESSING PLURALISTIC ENVIRONMENT

To address the pluralistic nature that could be present in a group, this research uses program planning model to, which is a group process model to give voice to every participant in planning activity, to gain insight about the complex and complicated systems states (see Fig. 1).

### **Program Planning Model (PPM):**

Program Planning Model (PPM) was originally developed for two objectives (a) identifying strategic problems and (b) developing appropriate and innovative programs to solve them (Delbecq and Van De Ven, 1971). To achieve these objectives PPM divides the program planning into five distinct phases. PPM seeks to provide a structured and explicit process for participant's involvement within each phase of planning. PPM takes help from nominal group technique for decision making at different problem-solving phases to address the pluralistic nature of planning groups. There are five phases in PPM and each phase involves different type of people; a short description of these phases is provided below and these descriptions are based on the work of André L. Delbecq and Andrew H Van De Ven (1971).

#### *Phase I: Problem Exploration (consumer groups and first line supervisors)*

Objective of this phase is to discover, rich problem dimensions through the inputs of clients and facilitated by Nominal group technique. This phase involves a meeting with clients or consumers of different backgrounds, age and subject knowledge. The meeting facilitator first divides the group members into several subgroups depending upon their background. Each individual is asked to list aspects of the problems on a separate sheet of paper without speaking to anyone on the table. Then the members of the whole group debate on each individual listed item in round robin fashion. In this discussion members are allowed to clarify, elaborate and defend their item on the list; then each member votes privately on the five most crucial list items in each subgroup. Further, the result of voting is reported to the whole group and asked to vote on their representative for the next step. Listing down the important aspects of the problems, creates a social tension in the group making sure that each member is involved fully in problem exploration phase, this personal commitment facilitates rich creation and discovery of problem aspects (Victor Thompson & Smithburg, 1968).

#### *Phase II: Knowledge Exploration (external and internal subject matter experts)*

Structure of this phase is very similar to the problem exploration phase. This phase involves people with scientific expertise in the pertaining field and the priority items discovered in the first phase. The members of the group are asked to list down solutions and components presently available in the organization and then new solutions components and resources which could be developed. Then in similar round robin fashion to the first phase, groups debate on the components of the solutions to the problems and then vote on the most important features of the solution that are absolutely essential to the final solution. As each group reports the votes, the whole group discuss on the components of the solutions and resources required. The objective of this phase is to obtain legitimate and essential solution components and resources required, through a cross functional team.

#### *Phase III: Priority Development (resource controllers and key administrators)*

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This phase includes people who control the resources required to implement the solutions and key administrators along with representatives from phase I and phase II. In this phase outputs from prior phases are presented to the resource controllers and key administrators to take their input. The representative experts from phase II provide a thorough problem and solution analysis to facilitate discussions. Often key administrators and resource controllers veto a solution because of infeasibilities, the objective of this phase is to obtain responses from the potential critics of the program who are in a position to withhold resources or to negate the appropriate involvement in implementation of program. This phase takes place at a stage where solution components are still flexible and open to changes and improvisation.

### *Phase IV: Program Development (technical specialist)*

In this phase, working from the outputs of first three phases the technical specialist along with administrators develop a specific and finalized program or solution. It is important as a solution developer to remain sensitive towards the critical factors that arose during first three phases of the process.

### *Phase V: Program Evaluation (consumer groups, subject matter experts and administrators)*

This phase brings all the representatives from first three phases to evaluate the finalized solution. This phase addresses the fact that the some of the critical concerns may have been unheeded in the technical development of the solution. This phase objective is to establish a clear link between the developed solution and the problem dimensions and resource elements identified in previous phases; and therefore, makes sure that all the critical factors have been incorporated in the solution.

It can be observed that phases in PPM resembles the steps in eight-step problem solving process. Tracing these phases in program planning model to eight-step problem solving process along with the decision models provided in the Cynefin framework, this research provides a conceptual model for Jishuken process in complicated and complex domain.

## **SOLVING PROBLEMS WITH JISHUKEN**

As previously discussed problems solved with Jishuken mainly lie in complex and complicated domain of Cynefin. Every domain in Cynefin demands a different approach to solve problem, to cater to the need of complex and complicated domain this research proposes two models as per the distinct decision models for Complex and Complicated domain provided in Cynefin framework. This research proposes the following procedure for Jishuken.

Similar to traditional Jihshuken process, a Jishuken team will be set up by facilitator for one of the three purposes described previously in the paper which are, a) Establish a new standard b) Improve a standard c) Attain a standard. After identifying Jishuken's purpose facilitator will now choose the Jishuken team. It is advised that facilitator chooses a team for Jishuken such that it consist of few people from level in the organization which needs improvement, few people from a level above and below. Facilitator can also include people from different departments as well depending upon the requirement of the problem.

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Depending upon the purpose of Jishuken team, facilitator will now choose either of the two-model approach given below. For instance, if identified purpose of Jishuekn is to improve a standard or attain a standard facilitator is advised to follow Complicated domain model; similarly, if identified purpose for Jishuken is to establish a standard, of which there is no knowledge available facilitator will choose Complex domain model.

### **Proposed Conceptual Model for Jishuken in Complex Domain**

This model is divided into three distinct phases each consisting of different members of the organization. Description for each of the three phases is given below:

*Phase I:* This phase will involve people from Jishuken team. In this phase, the team leader will describe the current state situation to the group in the first step and will discuss about a possible ideal future state.

In the next step, Jishuken team with the help of nominal group technique will try to identify involved variables. Where, each Jishuken team member will be asked to list down the variables that he/she think are involved and in a round robin fashion will be allowed to clarify, elaborate and defend their variable selection. Then Jishken team will vote on the variables.

In the third step of this phase, team leader will report the results of the voting and based on the voting Jishuken team will try to address the variables with different possible interventions. These last two steps of this phase can also include experimentation to perceive the pattern and possible interactions between the variables.

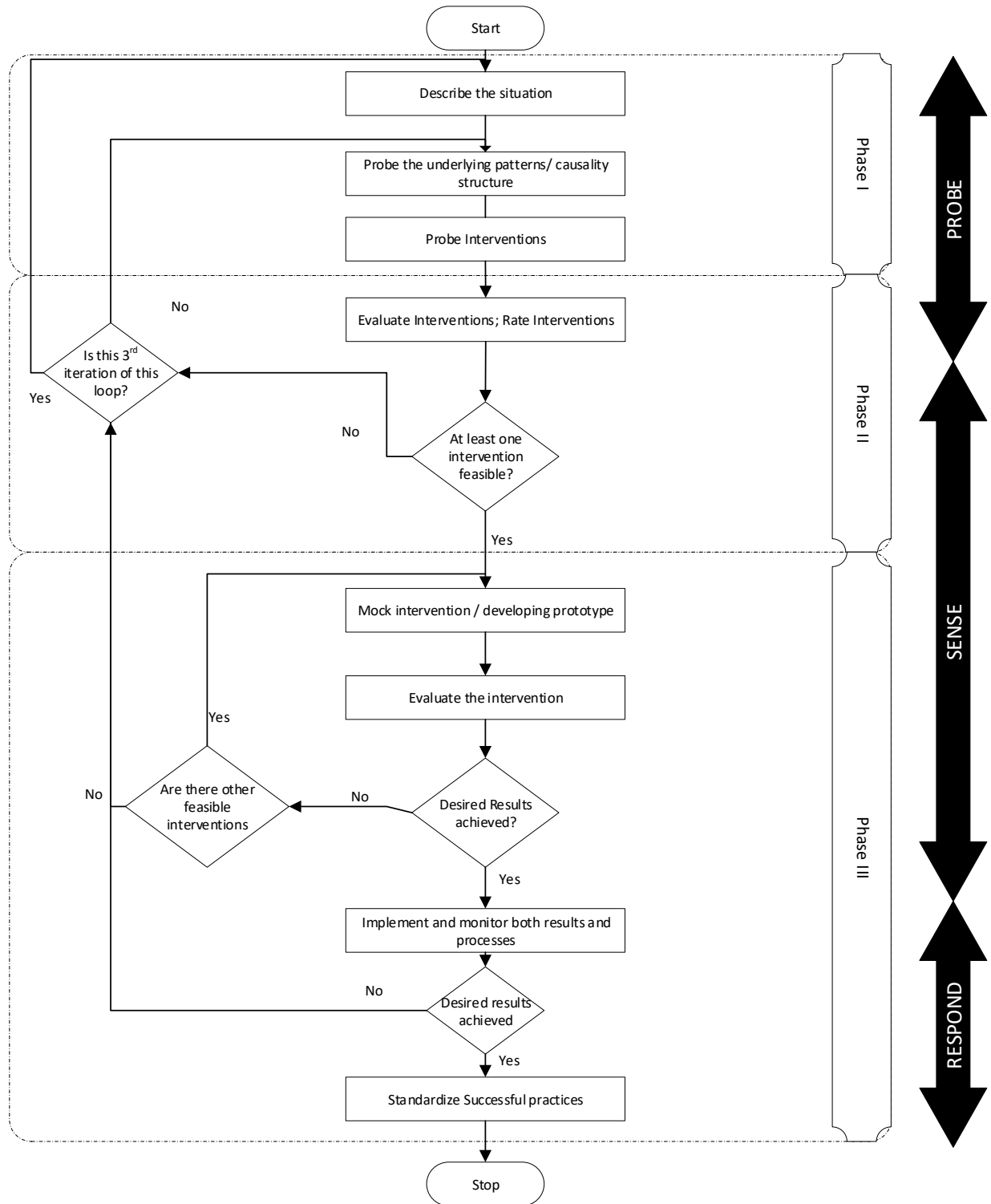
*Phase II:* This phase is similar to priority development phase in PPM, this phase involves key administrators and resource controllers along with Jishuken team members. In this step, the Jishuken team and key resource controllers will discuss the possible interventions developed in previous step. This discussion will follow rating the possible interventions with the most feasible and optimal intervention at the top. If none of the intervention is feasible Jishuken team will go back to try to figure out different variables and possible intervention. If the Jishuken team gets trapped in this loop, it is advised that Jishuken team should try to get a new start with the initial step which is to describe the situation.

*Phase III:* This phase again consists of Jishuken team members but it also requires involvement from people outside the Jishuken team but working in the same field. After evaluating the possible interventions, the Jishuken team tries these interventions in safe to fail environments. If the desired results are achieved. Jishuken team moves forward to implement the intervention on full scale. If desired results are not achieved team tries the next best possible intervention. After achieving desired results in the experimentation team moves forward to implement it on full scale and monitors the interventions and outcomes. It is advised seek input for the monitoring process with the help of other members of the organization. If the desired results are achieved this improvement is documented and standardized across the organization.

Similar to conceptual model for Jishuken in complicated domain, conceptual model for Jishuken in complex domain is also made robust to ensure that Jishuken team is not trapped into a loop (see

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figure 2). If the same loop is iterated three times, the model suggests learning from the outputs of various stages, where the intervention failed and incorporate the learning when starting new.



**Figure 2. Conceptual model for Jishuken in Complex domain**

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### **Proposed Conceptual Model for Jishuken in Complicated Domain:**

This model is divided into four phases each consisting of different members of the organization (see figure 3). Description of each phase is given below.

*Phase I:* This phase involves Jishuken team members and three distinct steps similar to the first three steps of eight- step problem solving process. First step is to clarify the problem, where Team leader clarifies the problem to the Jishuken team.

In the next step group tries to break down the main problem into smaller dimensions of problem, through the means of discussion. This is followed by identifying most crucial dimensions of the problem.

Next step involves setting target for each identified dimension for the improvement. When the most crucial dimensions have been identified team leader and facilitator make sure that they have expert and knowledgeable people in the team to address the need of various dimensions. If the current team lacks the expertise required, facilitator arranges to add subject matter experts to existing Jishuken team depending upon the requirement of the problem.

*Phase II:* This phase includes the Jishuken team and newly added subject matter experts, in the first step of this phase root-cause analysis is done by the experts for the dimensions explored in phase one. When the analysis is complete, these experts report to Jishuken team leader.

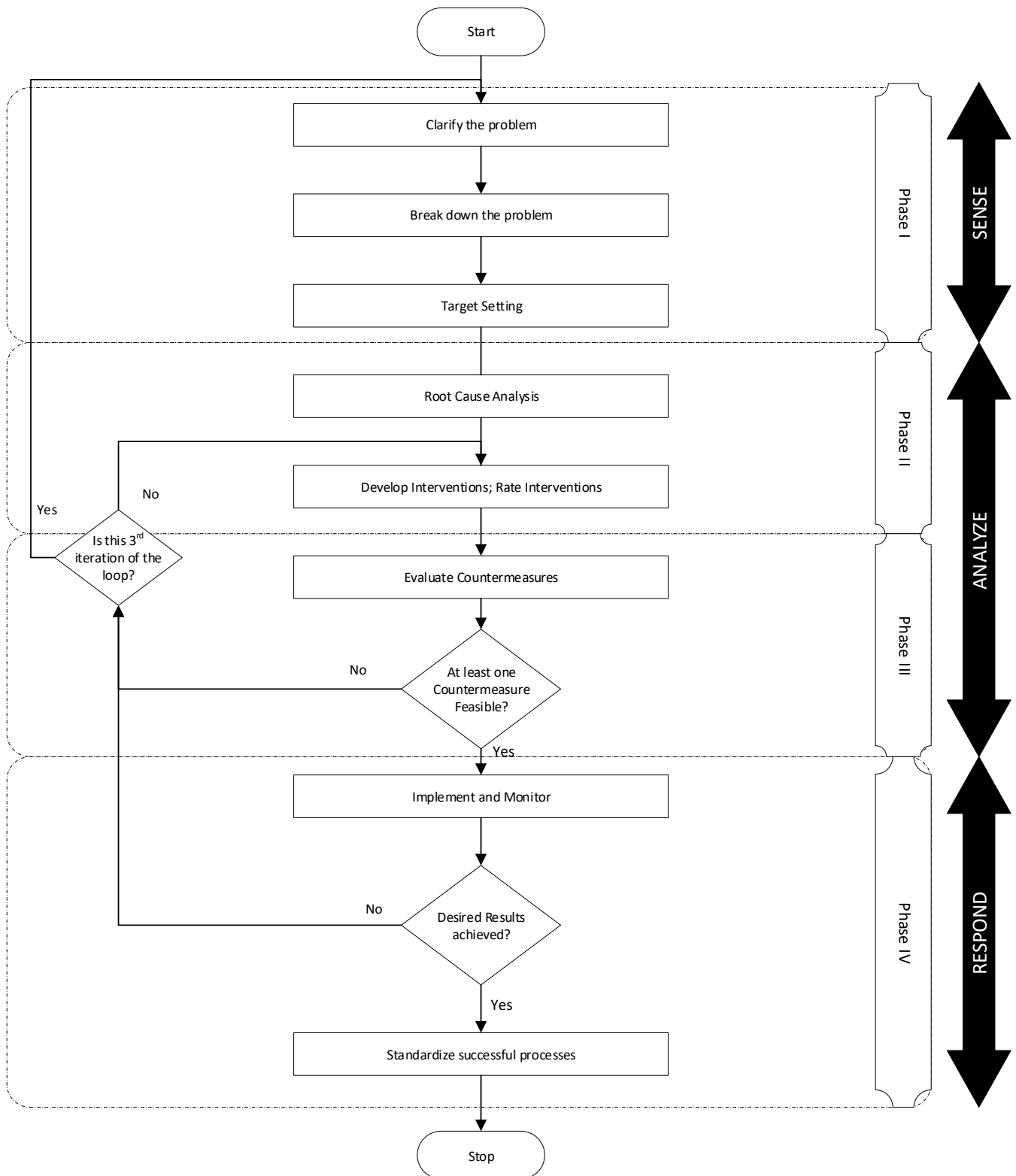
For next step in this phase, The Jishuken team leader calls the Jishuken team, specialist and facilitator for meeting. Jishuken team follows nominal group approach to come up with different counter measures. Followed by discussion on each countermeasure and input from the experts. Each Jishuken team member is asked to vote on the alternatives. Results of this voting is provided to the experts to gauge the resource allocation needed the top contending alternatives.

*Phase III:* This phase is similar to Priority development phase in PPM, in this step resource allocation gauged in the previous step is presented to the Jishuken team and resource controllers. An alternative is selected through thorough discussions and taking input from resource controllers on available resources and organization's policy and needs. If none of the alternatives are determined to be feasible, the Jishuken team goes back to developing new alternatives and tries to design alternatives which also incorporates feedback from phase III.

*Phase IV:* This phase involves Jishuken team members along with co-workers who are not part of Jishuken team but work in the same field. In this phase Jishuken team members implement the countermeasure that was selected in phase III. Jishuken team member and co-workers monitor the new process, to check if desired results are achieved. If desired results are achieved, then Jishuken team documents and standardizes this improvement across the whole organization.

To make sure that Jishuken team is trapped into a loop, the facilitator is advised to start the process afresh from phase I after three iterations of any loop in the conceptual model.

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**Figure 3. Conceptual model for Jishuken in Complicated domain**

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## CONCLUSION

This research provides an argument that Jishuken's cross functional and cross organizational team enables Jishuken to solve broad range of problems, but the eight-step problem solving procedure is not capable of handling strategy level problems and addressing the pluralistic environment that could be present in a Jishuken team. This research defines four different system states that Jishuken process is capable of handling due to its group structure. This research also proposes elaborative conceptual models for Jishuken to operate in these states by taking inference from Cynefin framework and Program Planning Model.

The operational definitions provided in this research can help a Jishuken facilitator to identify the system state his/her problem lie in and to choose appropriate approach to solve them. To help Jishuken team further conceptual models provided in this research can act as a step-by-step guide to implement Jishuken process effectively.

Future work for this research is to validate models provided in this research by implementing the proposed model in real-life work environments.

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## MANAGEMENT-LED PARTICIPATIVE CONTINUOUS PROCESS IMPROVEMENT

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