

A Cynefin Framework for Agile Decision Making of AI BOTS

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Abstract. The concept decision-making AI Bots is introduced. The modern Agile systems and structures are analyzed. A methodological approach of the study using the concept of Cynefin Framework in agile decision making of AI bots is proposed. The Cynefin transitions between the different domains are illustrated through the rotated Snowden's v45° unfolded cylindric overlapping version. The cycle of adaptive change is used to analyze the effect of Cynefin Framework in the agile decision-making system of AI Bots. Analysis of the results, as well as relevant discussion and conclusions are proposed.

Keywords: *Cynefin Framework, AI, Agile, AI-Bots, Decision Making, Complexity, Cycle of Adaptive Change*

I. INTRODUCTION

According to one of the Forester Surveys [7] "85% of customer interactions within an enterprise will be with software robots in five years time" and "87% of CEOs are looking to expand their AI workforce" using AI bots. The Subject of this study is implementation of Cynefin Framework in an Agile system with AI bots. The main goal of the analysis is to introduce a decision making model in order to improve the AI bots' efficiencies in Agile systems.

II. CYNEFIN FRAMEWORK FOR AGILE DECISION MAKING OF AI BOTS

The Concept of using Cynefin Framework in agile decision making of AI bots

Most of the modern companies that want to stay relevant and on the right page of emerging technologies are using Agile Methodologies or are at a certain point of implementing AI support tools such as Bots. These tools are digital assistants, chat bots and other machine learning instruments. Virtual machines in big businesses are getting more and more "intelligent", since virtual assistants are now able to help average employee even with decision making tasks. These tools run through all the data and based on the programmed algorithm, they choose the most appropriate approach.

David Snowden said: "The nature of the system determines the way we can know things, how we make decisions, and how we act." The nature of the system of which the AI bots are part of is determining the decision making and how they will act in certain situations [1]. David Snowden is the creator of a decisions making methodology called Cynefin [3]. The Cynefin sense-making framework helps to perceive situations and make a decision based on the situation or other people's behavior. It is based on five

domains: Complicated, Complex, Chaotic, Obvious and Disorder.

The Modern Agile Organizational Structure

The Modern agile organization has to adopt to the emerging technological advancements and numerous market changes and at the same time to keep on track on the emergence of new superior competitors. It is a fluid and flexible framework for anticipating, designing and fulfilling business objectives through application of innovative tools [10]. The futuristic look at a modern agile organization provides a look at a company which not only can properly react to frequent changes, but also to properly manage the company's resources and provided services in order to be competitive. To stay on the top, the employees of the company have to make very tough decisions.

III. METHODOLOGICAL APPROACH OF THE STUDY

The Cynefin Framework is a sense-making framework to help make sense of complex systems by explaining behaviors, decision-making and practices in terms of people's patterns of multiple experiences, personal, cultural and business based. The Cynefin Framework consists of five domains (fig.1), which reflect the perception on the relationship of cause and effect. Each domain implies different managerial style and needs of various tools and understanding [5]:

The Simple Domain is in rule based ordered system which contains predictable cause and effect. The employee is self-evident and can clearly identify the problem, categorize it and adequately respond and easily provide a solution.

The Complicated Domain is similar to the Simple one with the difference that the employee is not self-evident and needs to analyze the problem in order to provide a solution.

In the Complex Domain has a interrelation between cause and effect which can only be grasped in retrospect and the results are unpredictable. This domain represents the principle of "probe-sense-respond" [5].

In the Chaotic Domain has no cause and effect relationship can be determined and are not clear to the employee. The main responsibility of the manager in this situation is to stabilize the situation and to act quickly.

The Disorder Domain (in the center of the fig.1) is a situation when the employee is uncertain in which domain he is located. He is uncertain of the cause of the problem and which exact approach to choose to solve it.

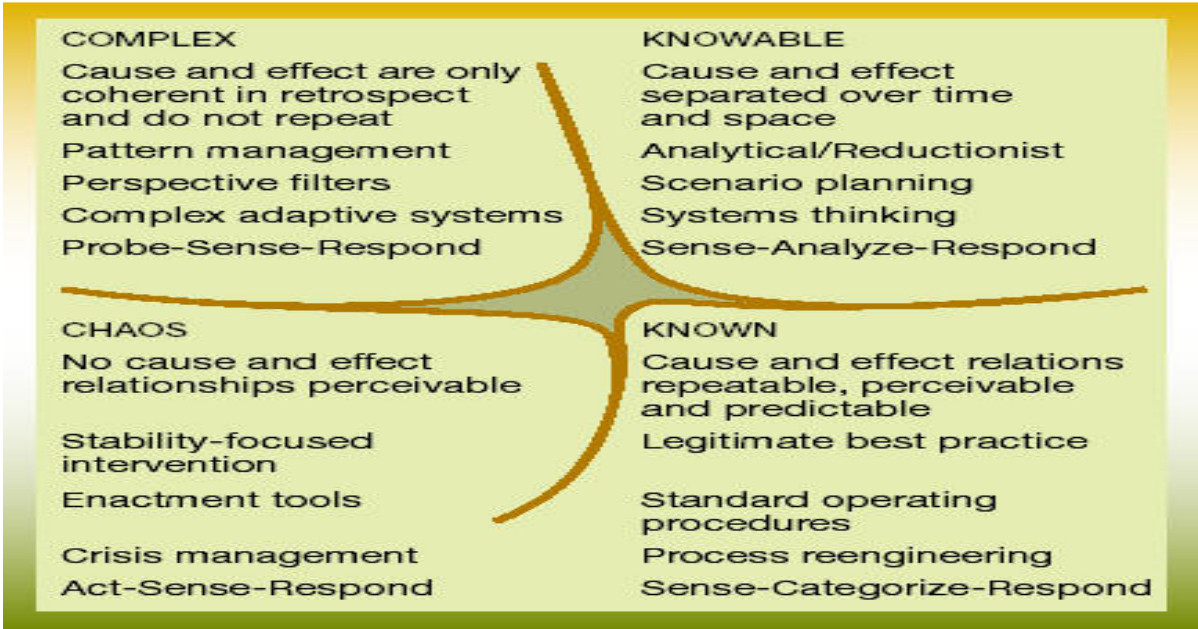


Figure 1. The Cynefin framework drawn from Kurtz and Snowden (2003)

Cynefin Transitions

In this section we will use the rotated Snowdon’s v45° unfolded cylindric overlapping version which better illustrates in fig. 2 the transitions between the different domains [8].

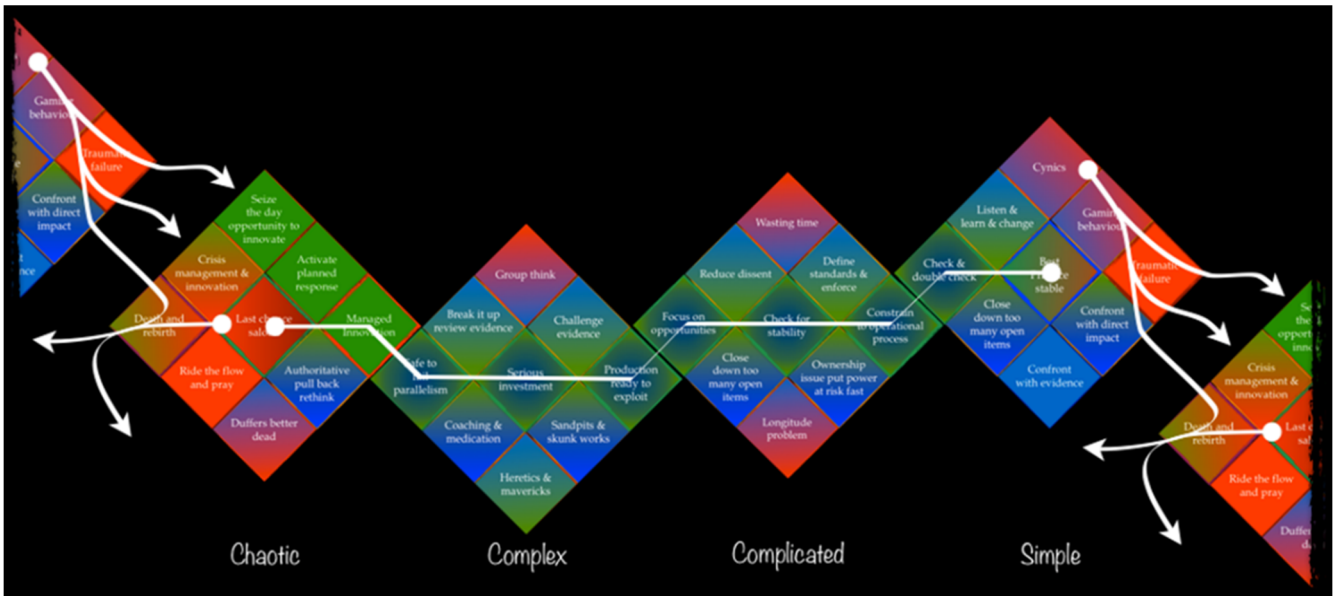


Figure 2. Cynefin v45° Transitions [8]

One of the hardest models to maintain is the Chaos model. One of the greatest disadvantages is that it is really difficult to maintain. There are two usual outcomes when it comes to applying this model. Either the model collapses completely or because of variety of form of constraints the user is transferred to the complex domain again.

The Cynefin domain models usually come to Simple, which leaves Complex and a more general overview of the cylinder overlapping of all four models. The overlapping nature of the simple model changes all the labels that had to be reversed and the whole position Complex took a bit of manipulation to achieve.

Into the Complicated domain the line of coherence runs through three stages:

1. From exploration to exploitation: This is when for the first time is appropriate to use the consultancy speak language of alignment.
2. When an opportunity with exploration purpose is being opened before moving back to complex
3. Constrain behavior to process: Convincing people to move on, based on the instituting performance measurement.

The Cycle of Adaptive Change

In fig.3 an adaptive cycle model with respect of the comparative study of the dynamics of ecosystems [12] is being derived. It is focused upon destruction and reorganization and provides better view of the system dynamics that links together system organization, resilience, and dynamics.

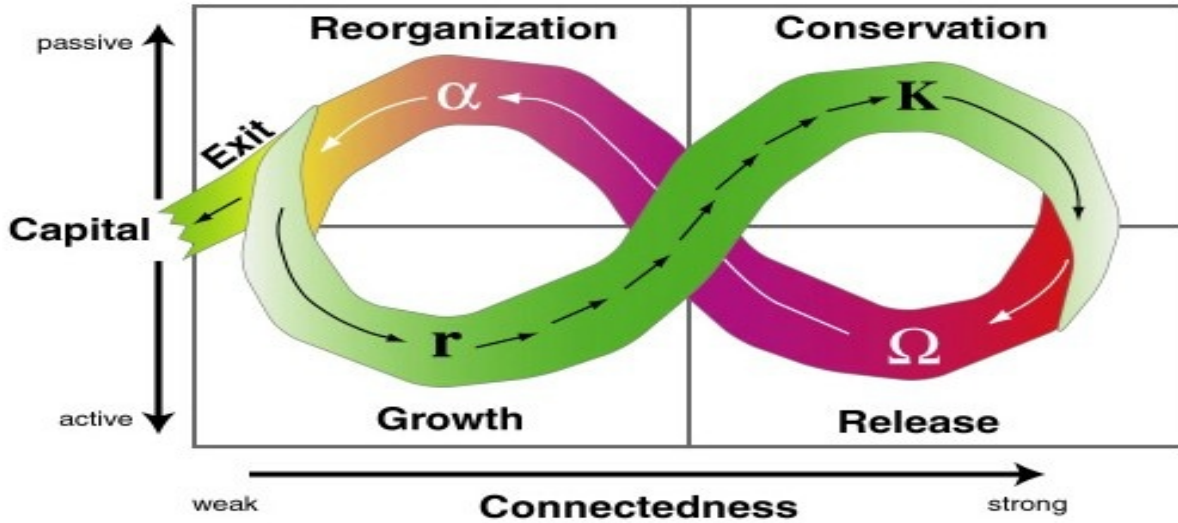


Figure 3. Adaptive Change Cycle in social-ecological systems [11], [12]

The cycle of adaptive changes is used to bring more awareness on what is happening in complex systems. Its sole purpose is to generate opportunities for innovation in a short amount of time.

Adaptive cycle is being identified with four distinct phases [9]:

1. growth or exploitation (r)
2. conservation (K)
3. collapse or release (Ω)
4. reorganization (α)

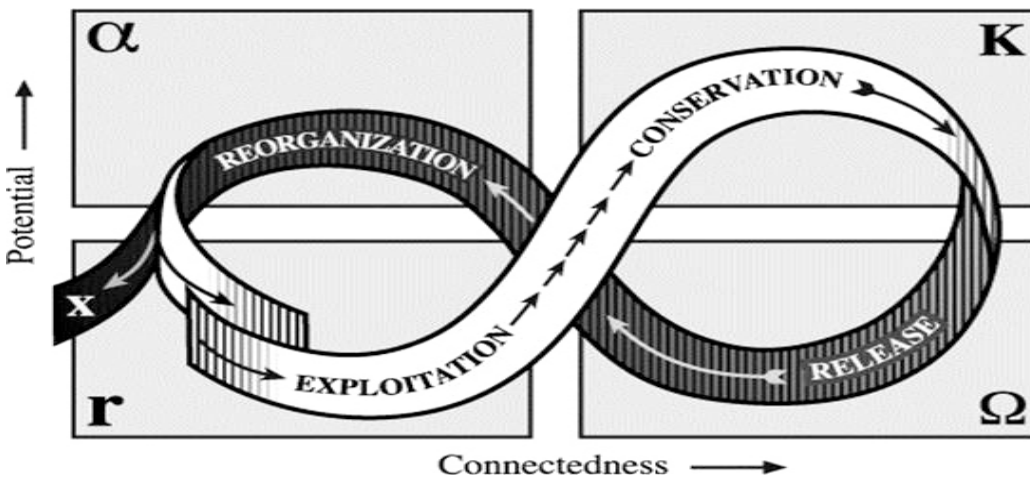


Figure 4. The Cycle of Adaptive Change [9]

By using the adaptive cycle major transitions (phases) are being exhibited:

- Incremental phase of growth and accumulation, slow, from r to K - Foreloop
- Phase of reorganization leading and renewal, from Ω to α - Backloop.

The Effect of Cynefin Framework in Agile Decision-Making System of AI Bots

Cynefin as a tool for making sense of IS, concentrate on change and diversity. IS is shaping humans social and organizational history and the uniqueness of using it comes from the computer-based information and massively spread communication tools. IS are being distinguished from the other technical fields, because of its concern of human

elements in organizational and social systems [14]. Cynefin framework can help the AI Bot to accept the diversity and change as strengths and use the framework to support realistic research and practice. It assists the AI to learn and gather knowledge and experience from its previous experience. Sub-methods such as the cycle of adaptive change can help to make the system better structured by providing a better perspective by viewing it as a human.

The Cynefin framework won't be able to provide the correct response to AI bots, but by applying it to an Agile organization with well-established AI bots system can become a very powerful tool. By applying machine learning to the AI bots, the perspective that the Cynefin network provides can be recorded to the memory of the Bots. This means that a combination of the three tools: Cynefin network, AI Bots and Machine learning can provide a super powerful instrument which at certain point will be extremely efficient. This leads to a future where the AI Bots can learn from their mistakes record them and at the same time view them in a more human perspective. Humans as well can apply Cynefin, but it is common for humans to repeat their mistakes and the application to AI Bots removes this factor. The AI bots have the advantage over humans and that is that they can make the mistake only once and after the mistake and the solution is recorded, they won't repeat it. There won't be any need to invest in courses for the companies to teach the humans how to be more efficient. By applying the constantly evolving methodologies such as the Cynefin Transitions, the human approach to the problems by the bots will evolve as well.

The Cynefin approach can be applied by the AI bots in various applications in variety of systems. It can help the bots to assist with decision making in many situations. By applying a simple model, the bots can easily determine in which domain they are situated and what are the further actions needed by them in order to fulfil the provided tasks.

IV. CONCLUSIONS

The future is here. Technologies are frequently changing. Agile methodologies were considered state of the art approaches, which were used only by the innovative companies, but today everyone is using and talking about being more Agile. The implementation of digital bots to assist employees with their simpler tasks is here and it is happening now. It is really important for the developers and the companies to choose an appropriate model which will make the bot more "intelligent". The bots will have to make tougher and tougher decisions in the future. The application of a Cynefin Framework to Agile system will help the bots to become more efficient and increase their decision-making abilities.

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