**Term Project**

**Metaphor: Organization as Beehive**

Submitted to

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Course

***Organization Theory (MG-610)***

Submitted by

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# Abstract

The paper aims to discuss the metaphor of organization as a beehive synthesizing the concepts in organization theory to develop a structure that explains similarities between the two. The modernist, symbolic and post-modernist views have been used to explain beehive metaphor for organizations. Furthermore, different theories such as systems theory, contingency theory, population ecology, holography and institutionalization are utilized as theoretical lens to interpret beehive metaphor, build the conceptual richness and to elucidate how bees and members in an organization follow similar patterns of being.

# CHAPTER 01

## Introduction

The purpose of this paper is to examine the similarities between Beehive and organizations, drawing connections between the various themes that are related to the metaphor of Beehive and synthesize them in the form of the metaphor "organizations as beehive". The primary focus on how the employee and managerial interaction is dominated by the hierarchical constraints and how those in authority hold power is used to create a hegemonic pattern of being for those with limited or low power.

The field of organization theory is a combination of theoretical and empirical contributions. The use of metaphors in understanding organizations is not something new, as different scholars have created metaphors to explain organizational dynamics, using ideas in the surroundings to bring the organizational components into the light from the perspective of organization theory (Cornelissen & Kafouros, 2008). Since organizations are complex and require a high degree of abstraction, metaphors are useful in this regard. According to Morgan (2006), metaphors in organizational theory serve the purpose of providing a frame of reference to understand and interpret a phenomenon. The quality of a metaphor and its applicability in the organizational context depends on the clarity it can bring in terms of understanding organizational processes and structure.

The current paper has used Morgan's (2006) framework of constructing metaphors as an inspiration for developing a new way of viewing organizations through the metaphor of Beehive that is prescriptive in nature. As mentioned by Cornelissen et al. (2008), the metaphors used to understand organization theory have a prescriptive undertone, indicating their relevance as a theory development tool.

Considering the case of Beehive, there are some similarities that exist between a beehive and an organization, which will be examined in detail in the subsequent sections. Beehive metaphor reflects an open system, interaction between environment and the organization, the way job roles and responsibilities are organization and the pattern in which power emerges as a central control authority regulating the behavior of the members that are a part of the Beehive. Thus the paper will use the modernist, symbolic and post-modernist paradigm to analyze the similarities between Beehive and human organizations.

### Ontological and Epistemological Assumptions

Metaphors are constructions used to capture organizations' working (how organization works), a process that is interpretative in nature. The underlying philosophic assumptions of a metaphor can be seen in two different dimensions; epistemology and ontology.

A metaphor is non empiricist (epistemology) as it focuses on interpretivism. Interpretivism is that things exist and we give them meaning. So organizations exist and we give them meaning using the metaphor of Beehive and its different components. Weber's idea of verstehen initiated the basis of interpretivism (Crotty, 1998), where a researcher's role was seen as being related to development of understanding about the social reality, rather than trying to trace the causal linkages between different variables. Further development of interpretivist paradigm has been evident in the form of the work of Blumer (1969) and Cooley (1902), where the idea of verstehen was replaced with the idea of symbolic interpretivism put forward by Mead and Blumer (Crotty, 1998). It has been further discussed how the symbolic interactionism added a diverse set of methods to the domain of qualitative methodology.

Taking the notion of symbolic interpretivism as the foundation of metaphor building, the metaphor under study elaborates how humans interact with each other in the organization, forming a social structure and establishing modes of communication and power within this social entity.

As far as ontology is concerned, metaphors follow a realist ontology as the idea is that things like culture, power, authority, bias etc. exist in real and the role of a researcher is to examine these concepts and give them meaning. Therefore, for this term paper ontology is realist and epistemology is non-empiricist as the concept of organizations is examined using beehive metaphor, finding the similarities and interpreting those in terms of modernist, symbolic and post-modernist paradigm.

### Research Question

The main research questions for this conceptual paper is: "why this paper chooses beehive as an organizational metaphor?" Since metaphors trace similarities between a phenomena and organizations, the question posits that the conceptualization and the defining features of Beehive are also applicable to understand organizational life.

### Biology of Beehive

Beehive is made up of different groups of bees, including worker bees, drones and queen bee. Each of these bees has their own roles and responsibilities. The study of honey bees fascinated humans as bee keepers, molecular biologists, behavioral ecologists and honey hunters in diversity. The infrastructure of honey nest is made up of beeswax in proper uniformed and functional comb, beeswax produced by the workers by repeated series of process in a hexagonal cell. The comb makes the way of interaction between colony members and workers and its use for every possible thing, from larval nursery to all over the colonies. It makes the lens to observe that individual behaviors and social behaviors are at the heart of bee society.

There are three types of colony members in honey bee society with specific and specialized performance;

* Queens
* Drones
* Workers

The queen bee holds the power position and controls the functions in the bee society. The queen bee requires rich amount of food to perform critical tasks in the colony which indicates the position control of the queen bee. The queen bee’s slim lines hide the big sized ovaries which makes her capable of laying thousands of eggs in just one day, these ovaries work like a machine. The calm behavior of queen bee plays special role in the bee colony to control the behavior of worker bees and provide part of social glue in the bee colony which holds the honey bee life together (L.Winston).

Seventy-five years have been passed, but the breeding of the queen Steiner spoke about bee has continued and became the standard. Now that 60 percent of the American honey bee population have died, it is the time to be more careful as we being humans towards the life of honey bee societies when there are more artificial colonies of honey bee societies have developed. In order to do justice humans should be more aware of the main factors for producing hives in honey bee colony, which are wax production, manipulation of the drone population, sugar feeding, moving of the hives from location to location and yearly exchange of queens (Steiner).

The leaders in organizations work as queen bee who plays all their roles in specific manners and responsible for all the tasks happening in the organization. As the queen bee make sure that all the worker members of the colony are like a team so do the leader of an organization, he makes sure that everyone is doing their part in established ways and performing in a good productive team way. As the queen bee act like glue in the team so do the leader in the organization.

### Why Beehive Metaphor

Beehive forms a highly structured, controlled, and centralized society. It consists of a small kingdom with a queen as a ruler, drone, and workers. The Queen controls drones and workers' activities, explaining the Beehive's top-down approach and Pyramid structure. The honeybee colony's centralized structure distributes power in a structured way, and the decision-making approach lies with the Queen. Foucault suggests that power is not a tool that we individuals use. Instead, we are the tools of power. The same goes for Beehive, Queen, workers, and drones are the tools of power.

Bees live in hives with clear social organization. It may take several years for teams of workers and drones to work well together, but ultimately all they start working as a team. The hegemonic concept is visible in the Beehive as Queen orders drones and workers to survive in cold conditions. In simple words, one gives the order, and the other follows. Drones and workers take their suppression as a way of living. Postmodernism views also include that all ideas and facts are *'Believed'* instead of *'Known.'* Beehive also revolves around the same concept. They believe that they have specific duties to follow. They follow a pattern without questioning it, including the Queen.

There are four significant elements of beehive society:

* Power
* Resource
* Market space and
* Development Opportunity,

It explains resource allocation and what role the Queen, workers, and drones play in a beehive society. Foucault explains Discourse as a way of constituting knowledge, concerned with human expressions, often in language. Beehive also communicates its condition with the help of Discourse.

# CHAPTER 02

## Literature Review

Even though the concept of Beehive is primarily used in biology, it can be applicable in the context of organization theory as previous studies have used themes related to this metaphor to understand organizations. For instance, organizations in the context of the Beehive have been examined by Grothe-Hammer and Schoeneborn (2019), who analyzed the term Queen bee in Project Based Organization PBOs. Such organizations were seen as taking the position of a queen bee in the hive, whose role is to lay eggs and produce multiple worker bees as small organizations and outlives her children. Considering this statement, it can be seen that a large scale organization (queen bee) is long term, while the projects are temporary (worker bees), and the queen bee keeps on laying new eggs (creating projects). The decision making and communication within the scope of the project is managed by the organization, thus showing the position of queen bee as the decisional authority (Grothe-Hammer & Schoeneborn, 2019).

Another study by Van Belle et al. (2018) considered Beehive to reflect the organizational structure, using the concept to suggest that WHO should work as "beehive" to reduce the complexities emerging in the global health organizations. Through using beehive structure, WHO can create simple ways to discourse and communicate the problems which will lead to the development of creative ways to solve them.

Though the current paper aims to use the metaphor of Beehive for different organizations rather than limiting the discussion to project based business entities, mentioning such studies helps in setting the context for the application of the metaphor to organization theory. The key idea here is that the concepts associated with the field of OT are practically applicable to understand organizations through biology based metaphors whose foundations are organic in nature. Using this perspective, the following literature review includes brief overview of modernist, symbolic and post-modernist paradigms, along with discussion on themes of organizational power, structure and communication, as these components will lay the foundation of the discussion.

### Perspectives in Organization Theory

The field of organization theory has developed over the years, accumulating three different perspectives to explain organizational life and its working. These perspectives still hold relevance in current organization theory, making them an indispensable lens for understanding organizations. These perspectives include the modernist, symbolic and post-modernist view.

### Modernist Perspective of Organization

The modernist describes knowledge as what we can collect from our five senses. The primary aim of the modernist philosopher is to eliminate biases and focus more on objective knowledge. Modernists believe that to find the perfect recipe for an effective organizational structure is to find the relationship between the organization's structure and its performance. Modernists view the organization as machinery. Organizations are formalized, centralized, standardized, and usually run with supervision. Hierarchical based structures are followed by organizations. They are most efficient in stable and unchanging environments (McAuley et al., 2007).

The modernist perspective of organization theory has evolved in the form of multiple theoretical approaches that aim to prescribe the way organizations can be understood. Some of the theories pertaining to the modernist perspective include contingency theory and population ecology. The contingency theory argues that organizations need to examine the internal and external environment to identify the suitable course of action, while keeping the fit between different elements into view (Tosi & Slocum, 1984). Even though this argument has received criticism on the grounds that the idea of effectiveness is vague (Priem & Rosenstein, 2000), the contingency theory retains a prominent position in the organization theory literature (Burton et al., 2016).

Population ecology as the second theory related to the modernist view has its underlying inspiration traced back to Darwin's theory which proposed the idea of survival of the fittest and evolution. In the organization theory context, evolution and survival is dependent on the ability of the organizational actors to respond to the external environment, evolve and adapt in response to the external environment dynamics (Betton & Dess, 1985).

There is a wide variety of ecological perspective, and all focuses on the action of selection process in the organization. The adaptive perspective in the organization is more towards the top authority which is responsible for decision making and leads in a particular centralized way in the organization. The organizations responds to the external environments, manager and leaders formulate the effective strategies to implement and make decisions according to the circumstances faced by organization in critical conditions. Leaders, managers and top authorities make strategically decisions in the organizations when needed but there’s no chance to neglect the population of organization who tends to follow these rules and implement these strategies, it is the whole team of population in the organization who make all the possibilities to come across (Michael T. Hannan).

### Symbolic Perspective of Organization

The symbolic interpretive perspective concerns knowledge as a subjective based knowledge. It cannot be measured easily from the five senses, for example, personal experience and emotion. The key arguments put forward by this paradigm is that the focus of the researcher should be on studying and interpreting symbols which exist in the form of organizational culture and language and reflected through human behavior. Some of the themes that are examined in the symbolic view include the social construction of reality, organizational culture and symbols that actors in organizations use for interaction (Hatch, 2018). The symbolic perspective digresses from the modernist view in terms of its focus on the symbolic nature of human interaction.

### Post-Modernist Perspective of Organization

Post-Modernist Perspective highlights the importance of discourse and how language can reflect reality. Postmodern theorists view the relationship between Ideology and power. The ultimate goal of the postmodernism view is that it identifies the power tactics hidden in organizational communication and decision-making process. Postmodernists view that the managers having ultimate control over workers is unfair and they should use moral reflection to treat the workers with equality and fairness. The idea of emancipation has also been supported by post modernism. The concept of Hegemony is also visible in the postmodernist view (Hatch, 2018). It shows how values and culture within an organization lead to individuals giving in to power. The power and control over workers is made to be seen as normal through practices such as SOPs, monitoring and total quality management (McAuley et al., 2007).

### Open System Theory

Even though the general systems theory was not specifically developed for organizations, rather it was applicable on all forms of systems either organizational or biological. However, the key themes are relevant for organization theory (Wilkinson et al., 2017). The central idea is that an organization is a system which is the part of the larger system, thus indicating the existence of multiple subsystems constituting a larger complex system. Moreover, the general systems theory postulates that each of these systems has its own defined set of principles and the action taken by the actors in the organization are regulated through and defined by these principles (Wilkinson et al., 2017). Further development of the systems theory lead to the distinction between open and closed systems. The level of interaction with the environment and the self-sustaining nature of the system was used as a means of identifying whether the system was open or closed. Current organization theory argues that all the organizations are open systems, despite having different levels of open systems, they are open nonetheless (Weber & Waeger, 2017).

### Power and Hegemony in Organizations

An organization's structure determines the extent of the role, power distribution, and division of responsibilities. It also suggests the coordination and control of information and how to manage flows between different organization levels. A structure of an organization depends on the organization's goals and decision-making approach to achieve its vision. The distribution of power in an organization depends on the structure. If an organization's structure is centralized, then the decision-making power is focused on the top management and gives strict control over the department. Conversely, when the power structure is following a decentralized approach, the allocation of decision-making amongst the departments has a higher degree of autonomy (Fleming & Spicer, 2014).

Hegemony implies the domination of one group over another group. However, it is often supported by legitimating norms, customs, and ideas. The concept of Hegemony occurs when a culture or an organization's practices and values align with existing wealth and power systems. Such practices never explicitly persuade anyone. Instead, it indulges the person as a natural and conventional way of thinking (Ikenberry & Kupchan, 1990). Lukes's third face of power integrates with Gramsci's notion of Hegemony. This face of power occurs when social practice shapes the dominant work's desires and conduct against their interests and ultimately cause their oppression. Lukes's theory suggests the active consent to hegemonic interests. In simple words, workers scheme in their domination, which leads to paradoxes. For example, employees in an organization are granted autonomy and can abandon their self-interest to benefit the organization. The use of Hegemony in an organization also suggests the systematically distorted communication amongst employees. Employees' consent to their exploitation leads to exclusion and marginalization (Hatch, 2018).

### Institutionalization in Organizations

The concept of institutionalization has been examined in depth in the organizational theory literature. Selznick is one of the founding fathers of the concept of institutionalism. Institutionalization is the procedure where an organization transforms into an institution, and this happens over time. It works when the organization is infused with a value "Outside the Technical Requirements." The critical technique for infusing long-run purpose to day-to-day behavior. In simple words, it is the elaboration of socially integrating myths. The transformation of organizations into institutions is a concern for self-maintenance, which includes two steps. The first is the self-maintenance for a certain permanence and stability. The second step starts with when the organization gains stability. Aftermath loses flexibility because stability gives rise to behaviors and habits and making it challenging to implement all the administrative changes (Selznick, 1996).

### Communication Between Agents

Knowledge sharing and exchange are essential in Multi-Agent Systems (MAS). An agent is a persistent entity with some degree of independence or autonomy. An agent carries out a different set of operations depending on what and how he perceives. Agents usually contain another level of intelligence. Therefore, having some knowledge about its goals and desires is a must. The whole concept of a multi-agent system is built to reach different goals that are difficult to achieve by a single agent. In multi-agent systems, an agent collaborates with other agents to have social and communicative abilities. Thus, the communication between agents is a challenging part, and for this, agents must be able to:

* **Deliver and Receive Messages**: This is done at the physical level, where agents must communicate over physical and network layers to deliver and receive strings. They often use objects that represent messages.
* **Deconstruct the Messages**: This is done at the syntactic level, where agents deconstruct messages to decode the message to its right parts correctly. It includes different combinations like message content, sender, language, and ability to decode the message's content.
* **Understand the Messages**: This step is done at the semantic level, where agents must understand the exact message after decoding the symbols. It includes the ontology of the particular message, which describes the specific symbols. It must be shared or explicitly expressed to decode the information that is included in the message.

The communication between agents encourages autonomy and discourages any regard for other agent's internal structures. It also encourages a society of agents that can provide a solution to more complex problems. In particular, communication between agents makes it possible for different programmer programs and, above all, in different languages. Therefore, it is essential to have a common language shared by agents (Steels, 1998).

### Self-Organization and Complexity Theory

Complexity theory explains the way a system performs its operations while being a part of the larger system, the schemas that are at the operating core of the different subsystems, and the dynamics of these subsystems when they are facing change in stability. The concept of chaos has also been elaborated in the complexity theory, where it is positioned as a precursor for change and innovation (Stacey, 1996).

The deterministic non-linear system, concept of stability (it is precise, predetermined, specific forms produced and sustained in simple manner through negative feedback. Stacey (1996) has discussed about the role of individual and shared schema in defining the action taken by agents in a system. Both types of schema provide the agents with a specific set of rules that need to be followed in order to regulate the processes of the system that they are a part of. The individual schema is represented by the internal script or the world view that the agent uses to analyze a situation and identify the suitable course of action accordingly. The presence of individual schema implies that a situation can create different forms of responses from different agents. On the other hand, the shared schema is rules which are developed and upheld by the system and understood by all the agents that are a part of the system. Another type of schema mentioned in the literature is team schema, which is related to the dynamics of interaction between team members (Mohammed et al., 2000).

Another concept that is among the integral components of complexity theory is the notion of self-organizing, which is applicable to the themes such as flocking behavior among the birds. Self-organization has its applicability on the behavior of species who travel or act in a synchronized manner and seem to follow an invisible pattern that guides the behavior of each agent in the group, giving rise to a connected pattern of emerged behavior and outcome (Stacey, 1996). Besides the organisms, the human brain is also seen as a self-organizing phenomenon (Singer, 2009). Any change in the existing pattern of being causes chaos, which initiates the self-organizing process within a system, be it an individual agent, the part of the agent (such as the brain), or a complex system comprising multiple agents interacting with each other and creating spontaneous order out of the chaos.

### Holography

Holography is a complicated procedure that includes a photographic principle to produce 3D images. It helps to take measurements within the image with a core precision of a thousandth of a millimeter. The holographic method is used to evaluate deformation, vibration, and the lower resolution with the image's dimension. In real-time, the holographic image's deformed object is directly associated with its undeformed state of the holographic image. This concept was born out of a challenging technological problem where there is a need to improve the electron microscope's resolution (Collier, 2013)

The holographic in an organization deals with employees' perspectives. When people under the same roof collaborate to share a vision for an organization, they have their unique perspective or taste of the whole organization. They share responsibility for the whole and not just an individual piece.

The parts of each perspective are not identical as they present the whole picture from a separate point of view. After adding up the hologram's bits and pieces, the whole image does not change fundamentally, but instead, the same image becomes more powerful than the previous one. When more people have a shared vision, the vision does not change, but it becomes vibrant and powerful.

Within the holographic model, what is valid for the individual member directly influences the organization. As individuals, we bring to the organization is how our perceptions, assumptions, beliefs, values, and attitudes interact with the organization's direction and future capacity. Under the influence of a holographic model, we as employees articulate a purpose, vision, and mission to communicate in all aspects of the organization.

To be more precise, there is a specific element in the holographic model that we all need to be aware of:

* The holographic concept deals with the whole with the parts, context, and its interrelationships.
* One part of the organization, which includes one perspective, one view, any specific program or activity, reflects the idea and concept of the organization's whole.
* All the members of the organization work as a part. They reflect the whole of the organization through their behavior and work responsibilities.
* Each member of an organization has its own perspective of the vision, which is unique, innovative, and relates to the whole of the organization (Stacey, 1996).

### Queen Bee Phenomena and Syndrome

The Queen bee holds a central position in the Beehive as she not only unites the bees through pheromones but is also a source of the production of new worker bees, which shows that the continuation of the Beehive is dependent on the Queen. The concept of the queen bee has created interest among the organizational researchers who have examined its application in the female led organizations and women occupying managerial roles.

The scholars have analyzed the behaviors of females at the managerial position in the organization and deducted that there are certain self-serving behaviors that females at the top position in the hierarchy tend to adopt as a means of protecting their powerful position in the organization. This defensive behavior which is damaging for the other employees and for the organization, is termed as queen bee syndrome (Sobczak, 2018). Another term that has surfaced in the literature is the Queen bee phenomena which is associated with the perpetuation of gender discrimination in organizations as a result of male-dominated workplace dynamics.

Queen bee phenomena is viewed from the post-modernist perspective, identifying the male dominance in the workplace and its associated Hegemony causing the discrimination towards females. The discrimination is rampant to such an extent that even female workers become a part of the hegemonic dynamics through exerting undue control over their female subordinates and limiting their career growth prospects (Derks et al., 2016).

Human societies also play a contributory role in discrimination and Hegemony in the organizations. The social groups that are considered to represent minorities experience racial Hegemony from the groups that have a stronger position in the society (Gold, 2004). The Queen bee phenomena in this light can be explained through the findings of the study of Derks et al. (2015). The research suggested that not only females but other groups in the workplace that are disadvantaged due to their minority status experience queen bee phenomena from the superiors. Thus the people in a higher position of authority mistreat the marginalized workers, putting social Hegemony into organizational life.

## Conceptual Framework

The paper aims to discuss the concepts connected with the beehive metaphor, which are identified in the following framework. Each concept is analyzed in terms of relevant organization theory view and its different components. The open system and contingency components reflect modernist approach of analysis, while power structure, and queen bee phenomena are evaluated using post modernism view. Organizational social structure and institutionalization is discussed under the paradigm of symbolic interactionism and population ecology. The component of interaction between agents lends ideas from symbolic view and post-modernism view to see how communication patterns are shaped in organizations and how the centralization in Beehive and organizations is interpreted through these perspectives. Lastly, the concept of self-organization behavior of members of Beehive and organizations is discussed.

**Self-organization**

**Open system**

**Queen Bee Phenomena**

**Interaction between agents**

**Contingency**

**Institutionalization and normativity**

**Power structure**

**Organizational social structure**

**Holography**

**Population ecology**

# Chapter 03

## Discussion

The central theme of the paper is about explaining organization as a beehive, which entails identifying the key components where both of these constructs can provide a shared insight into organizational life.

### Organizations as an Open System

The overarching metaphor for this paper is organic, therefore the organization is seen as an open system. Contrary to the close system view, an open system is able to interact with the external environment. Organizations are seen as an open system, as they interact with the external environment and are influenced by it. Changes in the external environment lead to changes in the organization, with some of the changes being represented by the decisions taken by the management, while other changes are an outcome of the alterations in the external environment. For instance, the increasing rate of change in the environment requires the management to respond to it bring variation in its products or services to evolve with the changing trends.

### Characteristics of Open System

An organization is an open system because it fulfills certain criteria for being an open system. Burke (2008) has listed down the characteristics of an open system, two of which are relevant in the context of the present paper:

#### **Importation of Energy**

Organizations are not self-sustaining but need to take input from the environment in the form of raw material and resources. The Beehive in this context is dependent on the flowers that provide a sustainable source of nectar for the making of honey. The role of the honey bees is to explore the field outside the Beehive and identify the patches of flowers that are then used by bees for collection of nectar.

Similarly, actors in the organization examine the external environment for opportunities for growth and take on these growth opportunities to expand the business. In addition, the raw materials are procured from the suppliers from the external environment, customers are a part of the external environment, and the decisions made by regulatory bodies also play a critical role in shaping the environmental dynamics for an organization.

Since there are other systems in the environment besides the Beehive, the actions of those subsystems influence the decisions made by the actors from the Beehive. If the fields filled with flowers are replaced with construction and cultivation of crops, the bees will have to locate a new source of input, thus the action of the human society propelling the bees to hunt for alternate options. Actors in the organizations scan the environment for changes and decide according to these changes. For example, depleting sources of energy have caused interest in alternate sources of energy.

#### **Systems as Cycle of Events**

Beehive, from the point of its creation till the end, shows repeated cycles of collection of nectar, development of the workforce, the queen bee laying eggs to produce more workers, while the workers fulfill their own designated job roles. As long as the Beehive is intact, these cycle of interconnected activities will continue. Burke (2008) has seen an organization as a cycle of events, with the system following the initiation of action, taking input, processing it, creating output, and eventually providing the product/service to the users. These steps from input to product or service delivery comprises distinctive events as each event follows a specific set of protocols and is linked with the next one. Moreover, completion of product manufacturing doesn't result in cessation of operations but marks the initiation of the next cycle of events, which are repeated throughout the organizational life.

### Open System and Complexity Theory of Beehive and Organization

Since an open system postulates that there can be multiple subsystems within the macro-level systems, it is important to discuss complexity and complex systems in the context of organization and the beehive metaphor. Even though some of the critics view it as an outdated organization theory, some of the basic ideas presented in this theory are still applicable in current organizations (Ashmos & Huber, 1987).

The basics of complexity theory can also be applied to the metaphor of Beehive as a beehive is a single system that doesn't operate in isolation but is a part of the larger system comprising other systems having their own rules and shared schema. For example, there are birds that eat the bees, bees belonging to other beehives, the human population, and the patches of flowers that are the source of nectar for the bees. Each of these systems is regulated through its distinctive principles, while these subsystems interact with each other, as well as influence and are influenced by each other.

Negative feedback being one of the characteristics of non-linear deterministic system suggests that a system would focus on maintaining stability and would use negative feedback as an indicator of movement towards instability. Beehive has to maintain its flow of operations, which include a collection of nectar, protecting the Beehive, looking after the eggs in the colony, taking care of the Queen, and maintaining the structure of the Beehive. A disruption in any of these domains initiates corrective action from the bees, and they get to work on fixing the issue. The negative feedback indicates when there is a change in the stable equilibrium, such as the threat of an intruder, and action is taken, such as defending the Beehive against the intruder and resuming the equilibrium.

The threat of the intruder in the case of an organization is that of a competitor trying to take up its market share or customers. Organizations respond to the threat of competitors by revising their marketing strategy or changing the product or service feature to introduce something new to appeal to the customers. Another way organizations face external threats is the changing power of suppliers and substitute products, which warrants remedial action to bring stability back to the organizational processes and its way of being in the environment.

### Holography in Beehive and Organizations

The concept of holography is also relevant here as the interplay of principles of holographic design can be seen in both Beehive and organizations.

In an organization, when people under the same roof share their vision for an organization, each person has their own unique perspective for the whole organization. In simple words, each person shares responsibility for the whole, not only for themselves. The hologram concept represents that the image of the whole does not change fundamentally, but rather the image becomes more intense part by part. In a holographic model, organizational philosophy and structures support the individual's growth, and the individual will support the parallel growth in the organization. Holistic teams and diversified roles are a vital part of a hologram in which each strain of hologram connects with another to achieve their target. In an organization, the concept of holistic teams and diversified roles is visible. Every employee in an organization is multi-skilled and able to perform diverse functions to produce the whole product.

The concept of bee also relates to the hologram as workers and drones who are working individually have an intense impact on the bee comminute as a whole. The bees articulate a purpose, vision, and mission to be expressed in all aspects of the beehive community to which they work individually for their beehive community's betterment. Bees interact with each other and affect the direction and future capacity of their community. Bees also work under the holographic concept of holistic teams and diversified roles. Workers and drones perform diverse functions for their Queen bee and process the beehive community's whole product. In addition, the worker bees, while foraging for flowers, work as individuals. Different bees fly to different locations and directions and come back to the hive to communicate their findings with other bees. Once a location is finalized, the bees travel in teams to bring back the nectar, while the bees that stay behind engage in their own roles of looking after the younger bees and maintaining the hive.

In this way, both Beehive and organization fall under the holographic concept by working individually and as a team to build a whole out of the parts.

### Contingency Theory of Organization and Beehive

Contingency theory considers fit of central importance for an organization, suggesting that the alignment between factors such as organizational structure, technology, employee, and its external environment is the key behind growth and effectiveness (Donaldson, 2001). Successful organizations are not the ones driven by a resourceful network of actors, but the actors that can produce the right fit while keeping the contingency into view (Hatch, 2018).

Beehive comprising of the different actors with specific roles, illustrates how the concept of fit and contingency can be applied. When a situation arises whereby the bees are required to take action, they consider the fit of the Beehive along with its environment. The behavior of searching for the field for patches of flowers is one such example where bees explore the nearby areas searching for new resources for honey production when the previous fields are cleared, or the flowers are unavailable. The ultimate decision is made for a flower patch that is closer to the Beehive, thus proximity representing the fit between Beehive and resource.

The concept of fit is evident in organizations through the focus on creation and maintenance of consistency across different organizational dimensions. Ensign (2001) has identified these dimensions as comprising strategy, organization, and environment. The decision makers in the organization aim to produce congruence between the internal and external contingencies to maintain effectiveness and efficiency. The proximity of resources in the case of organizations is not as simple as evident in case of the Beehive. The proximity is reflected through the availability of resources, and the decision-makers approaching those resources (materials, suppliers, employees etc.) that match with the internal contingency of the organization. The proximity is defined by the expected standards and the selection of resources from the external environment that closely match with these pre-defined standards. The selected action is seen as bearing optimal value for the organization, in the same way as bees gauge the suitability of the field area that should be targeted for nectar collection in terms of its optimality.

### Population Ecology

Population ecology concept is also useful in drawing similarity between Beehive and organizations as both of these entities are striving to survive with scarce resources and compete in ecological niche. According to Hatch (2018), the three components of population ecology, including variation, selection, and retention, support an organization in competing with other organizations. Variation is when businesses engage in generating new ideas and bringing novel concepts in the form of products or services. Selection involves the identification of the most suitable course of action or product that seems to offer the best fit given the environmental constraints and challenges. Retention includes maintenance of the processes that are vital for the success and growth of the organization by investing the needed resources in them. From the perspective of product making, older versions are replaced by new ones showing evolution for survival.

The honey bees, as a part of nature, are constantly engaged in the process of variation, selection, and retention. The notion of natural selection and fitness is relevant here as bees that are not fit to contribute to the processes of the colony leave the hive on their own. In case of a queen bee, when she becomes weaker and loses her ability to produce pheromones, the worker bees replace her by process known as supersedure (Hamdan, 2010). In organizations, the retirement of a person in authority indicates that the person is no longer capable of contributing as effectively to the organization as expected, therefore a replacement is made. The aim for both Beehive and organization is to survive and ensure the continuation of the entity by finding the right fit.

### Power Structure in Beehive and Organizations

Leaders have power in the organization as they can made decisions that employees have to abide by and follow. According to the post-modernist view, managers use their power to exploit the workers and take the benefit of their legitimate power to suppress the workers. The post-modernist view is of relevance when it comes to the analysis of the power structure of the Beehive and organizations.

Even though the post-modernist view can't be fully implemented on beehive metaphor as there is no desire for emancipation, some of the themes of power dynamics are observed in the case of Beehive and organizations. One such concept is of Hegemony, which is seen in the form of rules, defined roles for employees and the unyielding nature of organizational rules and procedures (Humphreys & Brown, 2002).

Bees' lifestyle revolves around the hegemonic process as workers and drones are under the influence of power. The queen bee has the ultimate authority in the hive as she uses pheromones to unite the bees and send them signals of her powerful position, thus motivating them to stay engaged in work. Human organizations have leaders to unite the work teams and employees, which can be equated with the uniting power of the queen bee.

Socially a parallel has been drawn between a beehive and society, viewing the former as a reflection of being responsible and industrious. The term drones was used for those people in American society who were not a part of the working class and were living in poverty. With the passage of time the term drone eventually transferred in the context of the Beehive, where the label was used for male honey bees (Horn, 2005). The implications of the application of bees classification on employees and people in a society signify the hegemonic division which was carried out by the powerful as the people who could contribute to the ends for those in power were deemed as more favorable. The drones in the Beehive have a secondary position as they neither contribute to the construction and maintenance of Beehive, nor the honey production process. Their existence is that of a parasite that is feeding off of other living beings and their hard work. When the poor and unemployed people were equated with drones, the thought process behind such a labeling reflected the disdainful attitude that honey bees have towards when the hive is in survival mode in winter as a food source is scarce. Due to scarcity of food (flowers and nectar) they can't afford to have drones in the hive who only feed and don't produce the food. Thus the drones are pushed outside the hive in the harsh winter to fend for themselves, which they are unable to do, eventually succumbing to cold and starvation.

The drones as individuals in human society are seen as useless people who are not contributing to society in any form. Thus they are seen as not deserving any support. Those who can contribute are able to find a place in the organizations and become an active part of the working community. In the organizational context, the workers who are not able to perform up to the defined standards are regarded as being useless by the organizations who view them as a barrier to effectiveness. As a result, the workers who are underperformers are laid off.

When the organization is under threat of any form, the group that is most likely to bear the consequences is the one that has a weaker position in the organization (Hardy & Maguire, 2016). Mainly, in this case, it is the employees that are at the risk of losing their respective jobs in case if the organization is underperforming financially. The Beehive, when facing a critical time, expels the drones to reduce the usage of resources and to increase the chances of the sustainability of the worker bees that are making a valuable contribution to the beehive community. In the same way, the queen bee is not seen as a dispensable part of the Beehive, but the same is not the case with drones (Horn, 2005).

Organizations put more emphasis on leaders, and their survival is linked with the survival of the organization, thus continuing the Hegemony and the exposure of disadvantaged members in the organization to risk and its consequences. The bees have to protect the queen bee in case there is an attack on the Beehive, the process which claims their lives, and the queen bee stays in the protection without making any contribution in the protection of the hive.

The power structure in an organization is maintained with a leader at the top position in the hierarchy. A similar application can be seen in the Beehive, where the Queen bee is serving as a leader, with the primary focus on uniting the bees, making the beehive operations running smoothly, and producing more bees to add to the workforce. A leader in an organization also plays a similar role by keeping the team focused on the task at hand, keeping the employees motivated, and making sure that the organization is maintaining its expected levels of efficiency. The employees and bees deem the leader as having the power to hold the organization together and to manage the workforce planning.

### Organizational Social Structure

Social structure in the field of organization theory is analyzed in terms of specialization, hierarchy and degree of interdependence of job roles in the organization (Hatch, 2018). A combination of these elements creates the social structure of an organization, which is primarily embedded in the modernist perspective. To further elaborate, division of labor and specialized roles in the organization are found in mechanistic organizations. Each employee is allocated specific tasks to perform, which adds up to the larger picture in the form of a finished product. Rather than one person working on the whole product, their role is limited to a specific part of the product, thus leading to the development of specialization in that specific capacity. Organizations have different departments, with each department handling specific tasks, which are connected to the overall organizational strategy and goals.

Beehive reflects a mechanistic structure as each group of bee holds its specialized job roles, which are also interconnected and interdependent on each other. Johnson (2010) has specified the two main aspects of the division of labor among honey bees related to their position in the hive. The queen bee has its own specialized role primarily pertaining to reproduction, while the worker bees engage in different activities for the sustenance of the colony and its inhabitants. Some of these roles include cell cleaning, nursing, and foraging. Despite having different roles, the bees are following the same goal of keeping the bee hive functional. In the same way, organizations focus on functionality and survival by adopting a formalized social structure that is deemed as suitable (Blomberg, 2020).

Another dimension of organizational social structure is centralization. The organizations where formal rules and procedures are implemented, and decision making is primarily a role associated with the top management have a centralized structure while decisions made by the team members or employees show a decentralized structure. A similarity can be drawn between a bureaucratic organization and a beehive as in both of these cases; the top management has the ruling power. The top management can affect the workflow in the organization, while the Queen sends signals to the worker bees to work efficiently and the bees have to follow the command, without having any input in the work decisions. The bees know what is expected of them and follow those job roles, without questioning the authority that is the queen bee. Workers in highly formalized organizations depict similar behavior, following the commands from the authority without any input in the decision making.

The Beehive can be regarded as a pyramid-shaped organization as the Queen has the authority, and the worker bees have low authority. The traditional work teams in the organizations also depict the same distribution of authority, with the team leader having the decision-making power and the employees follow the guidelines provided by the leader (Wellman et al., 2020). There is a clear line of command, evident in both Beehive and human organizations.

### Institutionalization and Normative Pressure in Organizations

Foucault has discussed the concept of power and its universal presence, which implies that the phenomena of power exist at every level in society. One of the most evident ways through which power can be observed in an organization in through normativity (Hatch, 2018). The workers respond to the normative pressure that exists in the organization. There are rules and regulations (which serve as normative pressure) developed by those in power, and the subordinates are expected to adhere to these rules. Those employees who fail to adhere to these normative standards are penalized, while those who follow these regulations receive a positive gesture from the authority. Another defining feature of normativity is that the subordinates view this control from the management as a normal occurrence. Bees' culture is similar to the postmodernism view as the total control over works by the Queen seems normal (Michene, 1974).

Apart from rules, organizational culture also exerts pressure on the employees to conform to the prevalent norms. Even in situations where the individual's norms may differ from the organization, the dominance of organizational norms takes precedence, and the resultant action of the employee becomes a reflection of the normative pressure. Employees may end up engaging in unethical business practices or feel forced to not intervene even when there are unethical business activities going on in the organization due to the dominant scheme, which in this case buildup as normative pressure (Voliotis, 2017).

Organization's social structure is a manifestation of the existence of power in the organization and a clear reflection of how the hierarchy can be used as a form of oppression and Hegemony. The case of bureaucracy discussed by Weber shows how hierarchy and rules are used as a means of controlling the subordinates in the organization. Along with that, components such as division of labor constitutes a part of the power, where the employees are allocated specific task, and the prime focus of the organization is efficiency, pushing employee well-being into the background. Similar to the specialized job roles in an organization, the bees also have specific responsibilities that are allocated to each group in the hive. It helps the bees in managing the production of honey, maintenance of the hive, development of the colony and feeding of the workers. Therefore, it can be seen that Beehive is highly hierarchical in nature. The functions of the Queen, drones, and workers are distributed on the nature of power they acquire. Each member of the beehive colony has a specific task to perform based on their hierarchical structure (Michene, 1974). Drones are responsible for controlling the activities that are necessary for colony survival. They can neither produce honey nor engage in defense of the Beehive, thus indicating the limited role they have in the bee colony. The major part of production work is managed by the worker bees. Reproduction and colony strength depend on the Queen of the Beehive, which claims strict top-down management among bees (Michene, 1974).

Lefort and Karten (1978) have compared Beehive's set up with a communal social structure, considering it to be a form of slavery. In a capitalist society, the capitalists who own the organization hire the subordinates to work and produce the goods according to their expected standards and displaying an expected level of efficiency. In the same way, worker bees have to engage in their job roles, with the expectation that their tasks will be performed with due diligence and effectively. The workers who can no longer remain productive or add value to the organization are treated as a liability and eliminated from the workforce. When the organization is facing financial difficulties, the employees lose the wages to protect the capitalists (Draper, 1977). The Beehive has the same rule for drones who are pushed out during winter as their job role is no longer relevant or needed. Keeping the drones in the hive is regarded as a waste of scarce food resources, and the drones eventually die outside.

### Interaction Between Agents

Social construction theory states that symbols are the primary building blocks of social reality, as the different people in an organization make sense of the things happening around them and the way different organizational processes are being managed. All interactions in the organization, whether formal or informal, can be viewed as symbols that formulate the patterns of interaction in the organization. The written rules are concrete symbols, while the unsaid norms prevailing in the organization are abstract symbols that are shared and understood by all members within the organization. A common binding force which also defines the patterns of communication in the organization is culture.

As far as communication among the bees is concerned, communication helps bees to send messages throughout the colony about their job roles. Bees have a special language of communication, i.e., a waggle dance, which is used to communicate about the finding of a patch of flowers (resources) that can be used to make honey (production). The waggle dance helps the bees to communicate about the exact location and distance of the flowers that were found by the bees and are seen as a good source of obtaining nectar. Apart from that, the communication between the different agents in the hive represents a well-connected network of communication between the Queen and the other bees (Horn, 2005). The bees, even though can't communicate in the same way as agents in an organization do, their communication fulfill the same goals, comprising informing about the job roles, the findings of opportunities and communicating about the external threats. Similar to work teams depicting high collaboration among the members, honey bees are highly collaborative in nature. Their absolute adherence to the unwritten rules and regulations makes the beehive-like a machine, where workers are just a part of the organizational machinery, the workers are fired or laid off when not needed, not regarding the human side, and their efforts and new workers are hired as per need. Machine-based organization approaches are no different from a beehive in this context.

### Queen Bee Behavior

The Queen bee is known for its central position in the hive in terms of the production of eggs, which create new workers, and for its ability to keep the bees united and engaged in work. The worker bees have one target; to keep the Queen bee safe and to serve it by feeding it and taking care of its needs. In case if the bee colony needs a new location for the hive, the queen bee is taken along by the workers, thus showing her central position in the hive. Another behavior that shows the dominating nature of queen bee is that if two queen bees are hatched simultaneously, both of them fight till one of them kills the other to become the ultimate authority in the colony.

In organizations, queen bee behavior is manifested in the attitude of females in a position of hierarchy and their dealings with the female subordinates. The queen bee phenomena enfold as the female leaders become more distant from their female identity in an effort to become a part of the male dominated culture (Derks et al., 2011). The female leader as the queen bee can't tolerate the progression of the career of another female as it is seen as a threat to the female leader's career and job position. The best way to deal with the perceived threat is to sabotage the career development of the person who is the cause of the threat, similar to the way the Queen bee kills the possible challengers to its position.

The queen bee phenomena is intertwined with gender discrimination in male-dominated organizations, so it can be stated that there is an undertone of Hegemony and power. In organizations where the issues of sticky floor and glass ceiling persist, the after effects of such continued discrimination become apparent in the form of females struggling to maintain power even at the cost of their own gender, thus contributing in the ongoing discrimination (Sobczak, 2018).

The persistent gender discrimination is also evident in the organizational and management literature as theories are formulated keeping the masculine qualities into view, overlooking the feminine attributes that are an essential part of workplace success. The feminist perspective to organizational theory has highlighted the way gender discrimination is keeping the females in the workplace behind, unable to reach their full potential while the males are provided greater opportunities to excel (Gherardi, 2003).

The Beehive reflects a bureaucratic structure where the rules are clearly defined and outlined. Any disruption in the existing equilibrium generates an action that aims to restore the equilibrium through taking the necessary actions. These actions are not highly creative in nature but follow a fixed set of rules and schemas. According to Stacey (1996), these traits are related to deterministic non-linear feedback systems.

Another point where Beehive and organizations seem to share similarities is self-organizing behavior. Organizations, when engage in self-organizing behavior, are trying to develop new patterns of being in an effort to deal with chaos. Coleman (1999) used complexity theory to examine the self-organizing behavior of business entities. He suggested that the complex adaptive nature of organizations is a reflection of dealing with creative tension that is the initiating point of change in the previous pattern and schemas. The agents and the systems both evolve during the self-organizing process as something new is created out of the paradox of stability and instability.

The swarming behavior of the bees to protect the hive shows a self-organizing tendency among the agents as each bee is focusing on the single aim of protecting the hive and the Queen. Millor et al. (1999) have pointed out an integral component of this defensive behavior by concluding that the behavior of honey bees when under attack shows the evolution of their attacking mechanisms, reflecting not only changes in their individual genetic coding but also self-organizing behavior that influences their collective response. Millor et al. (1999) stated that such pitchfork bifurcation" phenomenon of nonlinear dynamics shows how the attacking behavior and its related dynamics are emergent.

# Strengths and Limitations of the Beehive Metaphor

Metaphors are seen as paradoxical in nature as they provide a specific lens to see organizational life while causing constraints in terms of their limitations.

1. Humans are flexible and adaptable, and bees are orderly and meticulous. Humans are unpredictable and not always meticulous and do not always follow orders, but bees always follow order and function in an orderly manner.
2. Humans are creative and have the capacity to respond to chaos to create something new, rather than going back to equilibrium. The creativity and innovation of members of an organization is not explained by this metaphor.

# Conclusion

The conclusion drawn from the above analysis is that Beehive and organization have many similar aspects. Beehive is a complicated term, but just like many organizations work in a structured and centralized manner. Similarly, the beehive community work in a structured, pyramid, and centralized way. As we can see, the organization as machines, an organization as an organism and even and as a brain now, we have another metaphor for the organization that is Beehive.

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