



Hyphae & Fungi

An Insuperable Metaphoric Lens

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Summary

Imperative

Defining Leadership is not an easy task. I have been involved in leadership in one form or another, for around 30 years. Like many people when I came to writing my own program, I can honestly admit to struggling when I tried to define the key concepts and focus of the program.

Some people focus on its effect - to inspire, motivate or transform - while others believe it can be viewed variously as a service, process, effect, or enabling function. Yet more people look only at the structural elements of leaders, defining leadership by the control they exert over individuals or groups at an individual or systemic level. In fact, it is probably quite pointless trying to define leadership as an individual entity.

The problem I faced as I sat down to write my leadership program is that all these approaches are correct. To my mind at least, leadership is an invisible force, it is ethereal, sometimes its effects are more noticeable by their absence. When it is present, it presents itself in multiple forms depending on the environment and situation where it is required. It serves little utility when all is going well and cannot be quickly employed if things turn bad.

My inclination, which will become evident throughout this article, is towards a behavioural approach. Quite simply leadership needs to be present, visible and demonstrated. A reasonable interpretation of leadership, if I was compelled to choose one, is given by McKinsey & Company in a 2022 article on their website.

“Leadership is a set of behaviours used to help people align their collective direction, to execute strategic plans, and to continually renew an organization.”[1]

This definition neatly encapsulates a plural set of behaviours, as well as highlighting its effect on the individual and organisation. Furthermore, it also hints at the ability of good leadership behaviour to provoke and guide change. So, for those of you who like neat, compartmentalised definitions there it is.

I personally won't be relying on this definition, as good as it is. Instead, having been inspired by an excellent book I recently read, I am going to use metaphors from the lives of fungi, yes, you read that correctly, fungi! Most of the examples are taken from one specific book which I highly recommend. It is called *Entangled Life; How Fungi Make our Worlds, Change our Minds, and Shape our Futures* and is written by Merlin Sheldrake.

Why choose fungi? Quite simply, I needed an unassailable metaphor. A superlative, an actor that is beyond comparison. Each time I looked to model the behaviours on individual humans that have inspired us throughout history with their awesome deeds of leadership I realised how contextualised, specific and in some cases divisive these leaders were in their leadership behaviours.

I chose fungi because, they have been an active part of life on earth for over 1 billion years. In comparison, humans have only been around for around 1 million years. In terms of achievements, they have conquered no empires, but they were fundamental to creating and in maintaining life as we know it.

As life on earth first began, it was led by those first-adopters we call algae. Algae could never have left the water until they had managed a miraculous symbiotic feat, until they managed to combine with a fungi to form lichen. The algae relied on the fungi and their hyphal networks, as almost 90% of today's plant still do, to act as roots, searching for water, phosphorous and nitrogen.

This move from water to land created the explosion of plant life in our primeval carbon dioxide saturated environment. The explosion of plant life radically changed the earth's atmosphere creating more oxygen, something that was critical for the first animals to also move from water to land.

These animals in turn mostly, as they still do today, relied on this plant matter for food. Most plant eating animals, ourselves included, struggle to extract enough nutrition and calories from tough cellulose or lignin-based plants. Once more the fungi and bacteria came to our aid. Inside all creatures are millions of foreign fungi and bacteria, which we feed with the food that we eat.

These tiny micro-organisms in turn break down the tough plant material and release chains of proteins and carbohydrates that our own bodies can easily absorb. Without them we simply would not be able to extract enough energy to survive.

Modern medicine, indeed, ancient medicine has long used fungi and their nested bacteria as treatments, Penicillin is just one example. It could also be said that humans first began to quit their nomadic lifestyle and settle into an agricultural way of life with the discovery of yeast.

Bread and beer, or wine, whichever you prefer, can never take on their delicious form unless these tiny microscopic fungi are allowed to first feast on the raw ingredients.

Fungi aren't altruists they are symbionts. They trade with their hosts. They can be beneficial or toxic. Like leadership their networked power means that both positive and negative effects can be magnified.

Like leadership, fungi themselves also do not like to be clearly defined. They belong to their own unique kingdom of life and are neither animal nor plant. Somewhat more recently in 1877, "the German botanist Albert Frank coined the term 'symbiosis' to describe the living together of fungal and algal partners." [2]

The trick that fungi are continuing to perform until this very day is to create symbiotic connections, No longer able to tell where one species finishes and the one starts, they merge with another organism so intimately that they sometimes are classified as different species.

Only one rule is required. Any merger or colonisation must be symbiotic. The merger must create an effect or capability that the two original species didn't or couldn't possess on their own. In the case of lichen, the algae provided the fungi with a portable ready supply of energy, through its ability to photosynthesise and the fungi allowed the lichen to move.

This brings me to the most important reason for selecting hyphal networks of fungal mycelium for my metaphoric leadership lens. Fungi, like leadership have an intangible nature to them that defies clear definition.

Should we classify them by their form or function? Their form is that of an organic scale-free network, with each individual part selflessly given the freedom of action to explore its surroundings searching, communicating and connecting on a massively parallel basis. Hyphae's function is to seek opportunities for symbiosis, and to create new and ever-more capable units of life.

Introduction: The Invisible Architects of Life

Walk into a forest, and your senses are drawn naturally upward: the reach of trunks, the sway of canopies, the scatter of birdsong. Yet beneath your feet, unseen and largely uncelebrated, exists another world, a tangled network of life older than the trees themselves. This is the realm of fungi, and its architects are hyphae: gossamer threads that infiltrate soil, wood, and leaf, weaving life into a seamless fabric.

Fungi are the ancient collaborators of Earth. Without them, the first plants could never have colonized land, oxygenating the atmosphere and enabling the animal kingdom to follow. Without them, forests would collapse, nutrients would vanish, and ecosystems would shrivel into entropy. Yet fungi do not conquer or control; they connect. They build resilient systems by sharing, exchanging, and adapting. In this, they provide not only an ecological blueprint but a compelling metaphor for leadership, the kind that my program CLIMB Leadership seeks to nurture.

Hyphae, in their patient, unassuming way, illustrate what it means to lead without domination. Their success is measured not in their ability to exert control but in influence, not in singular triumph but in communal flourishing. As we face an era of systemic challenges, from environmental crises to organizational upheavals, perhaps it is time we learned from these ancient leaders beneath our feet.

This article sets out to explore leadership not as a title or a position, but as a dynamic set of behaviours, observable, repeatable, and adaptable, just like the actions of hyphae. In doing so, I move deliberately away from the notion of heroic or charismatic leadership figures and instead invite the reader to consider leadership as an ongoing, living process: decentralized, experimental, and resilient in nature.

By examining the way hyphae behave, how they seek, connect, support, and transform, we gain a powerful lens to view and reimagine leadership behaviour in human systems. Leadership, like fungal networks, is about responsiveness, generosity, renewal, and quiet persistence. In hyphae, we find not just a metaphor but a living demonstration of how we might better behave as leadership ourselves.

The Secret Life of Hyphae: Foundations for Understanding Leadership

Hyphae are the fundamental units of fungal life. Each unit an exact unselfish copy of the others, when combined it forms an organism whose slender threads branch, fuse, and explore their environment in a ceaseless act of discovery. A single hypha can stretch into a network, a mycelium, that sprawls for miles, operating as a decentralized, responsive system.

Each hyphal tip laying at the very extremes of the organism is a frontier post, sensing the terrain, shifting direction, branching when opportunity strikes. There is no grand plan, no executive command; but these humble individual parts of the whole, granted the freedom of action to explore are a constant embodiment of responsiveness.

In leadership, particularly **self-leadership**, we often imagine ourselves as lone agents forging ahead. But hyphae remind us that effective self-leadership is not rigid ambition but adaptive curiosity. It is about growing opportunistically, sensing when to branch into new projects, when to fuse efforts with others, and when to retreat. As Merlin Sheldrake writes, "Mycelium is a living, growing opportunistic investigation, speculation in bodily form." [2]

Moreover, hyphae embody the paradox of individuality and collective identity. Is a mycelial network a single organism or a multitude? The same can be asked of a leader: are they a solitary figure, or the **sum of all the relationships** and exchanges they sustain? Leadership, like mycelium, is less a thing than a process, a verb rather than a noun.

The invisible nature of hyphae also speaks to leadership's often unseen influence. Great leadership is rarely about spectacle. It is about the quiet establishment of trust and the understanding that your actions only serve to strengthen the whole, it is about the slow accumulation of credibility, the steady knitting together of a culture or a vision. It is about preparing the ground before anyone notices that anything has changed at all.

Self-Leadership: Hyphal Lessons in Growth and Direction

"Mycelium is a living, growing opportunistic investigation- speculation in bodily form. This tendency is known as developmental indeterminism: no two mycelial networks are the same." [2]

Self-leadership, at its core, is the ability to guide oneself through complexity, uncertainty, and growth. Hyphae, though microscopic and simple in form, are masterful examples of self-guidance. Each hyphal tip navigates its environment independently, responding to obstacles, opportunities, and feedback without waiting for external instruction.

This decentralized, self-directed growth models the essence of personal leadership: being attuned to one's surroundings while maintaining internal purpose. You see it is only when we are capable of focusing our attention correctly and observing our environment and those closest to us that we really understand how we and our actions are being perceived by others.

Hyphae must continually balance exploration and exploitation. They must decide when to push into new territory and when to reinforce existing structures. Similarly, self-leaders must know when to take risks and when to consolidate gains. Growth is not an aimless meander; it is a mindful, responsive act. Each decision a hypha makes, to branch, to fuse, to double back, mirrors the daily micro-decisions a leader makes to navigate personal and professional landscapes.

Furthermore, hyphae exemplify **resilience**. When damaged, a mycelial network does not crumble; it reroutes. New hyphae grow, circling around the point of injury. Leaders, too, must cultivate the ability to absorb setbacks, adapt strategies, and continue moving toward their broader mission. Setbacks are not failures but **invitations to innovate**.

Finally, hyphae teach us that self-leadership is relational. Though a hypha may move independently, it remains tethered to the network. Effective self-leadership does not mean isolation but the ability to maintain autonomy while remaining connected to the larger systems of which one is a part. Like hyphae, true leaders are never alone, even when forging new ground.

Taking this idea further, although all hyphae are essentially the same repeated tiny organelles forged together to form an organism, when they make contact with a new environment, rocks, rotting biomaterial, living plants, it alters its form.

The very act of creating a symbiotic relationship with those different to itself in its surroundings changes the nature of the extreme most tips of the organisation, all the while retaining enough commonality with the rest of the mycelium for the rest of the organisation to be able to effectively interact and communicate with it and most of all to benefit from its symbiotic pairing.

The Wood Wide Web: Networks, Collaboration, and Servant Leadership

“The word individual comes from the Latin, meaning un-dividable. Is the whole lichen the individual? Or are its constituent members, the parts, the individuals? Is this even the right question to ask? Lichens are a product less of their parts than of the exchanges between those parts. Lichens are stabilised networks of relationships, they never stop lichenising, they are verbs as well as nouns.”[2]

In the humid understory of forests, hyphae stretch and stitch, forming networks that connect trees in sprawling ‘**wood wide webs**.’ Through these mycorrhizal systems, trees share water, nutrients, and chemical signals. A tree suffering from drought may receive resources from its healthier neighbours. Saplings shaded from the sun are nourished by older, taller kin.

This fungal generosity is not charity. It is systemic resilience. By nourishing the weak, the network strengthens the whole. **Servant leadership**, the principle of leading by empowering others, finds its ecological corollary here. Leaders who prioritize the growth and health of those they serve, rather than their own prominence, create organizations that can weather uncertainty.

“Fungal networks sprawl over tens of metres, but trees are not linked evenly. Young trees have few connections, and older trees have many. The most well-connected tree is linked to forty-seven other trees. One skips across the network through a small number of well-connected older trees. Via these ‘hubs’”[2]

The structure of these fungal networks is not random. Research shows that some trees act as hubs or **super nodes** within each network, connected to dozens of others, facilitating swift resource flows and communication. These ‘**mother trees**’ invest heavily in the future of the forest, just as servant leaders nurture the emergent leadership around them. Influence is scaled not by dominance and superficial importance rather by its generosity and focus on others.

The image of fungi weaving solidarity beneath the soil offers a powerful counter-narrative to the myth of the solitary leader. No entity in the wood wide web thrives in isolation. Strength arises from interconnection, a truth equally relevant to forests and to human systems.

Symbiosis and Exchange: Values-Based and Action-Centred Leadership

Fungal relationships are not purely selfless. They are founded on negotiation and mutual benefit. Mycorrhizal fungi trade phosphorous and nitrogen for carbon from their plant partners. Where resources are scarce, the exchange rate adjusts; where plentiful, it relaxes. Symbiosis demands accountability.

Values-based leadership operates on similar principles. It requires clarity about what is being offered, what is being received, and whether the exchange upholds the values and goals of the whole. Leaders must constantly balance the needs of individuals and the collective, ensuring that interactions strengthen rather than sap the system.

Action-centred leadership, too, finds its analogue here. Fungal networks are in constant motion: branching, fusing, adapting to local conditions. When faced with a forked path, a hypha doesn't choose; it branches and pursues both options. Leadership demands this same flexibility, the willingness to explore multiple strategies, to fail without collapse, to learn opportunistically, and to balance the competing simultaneous demands of the task, team and individual.

Awakening Change: Inspirational Leadership through Fungal Wisdom

Fungi are not merely functional agents of ecosystems; they are catalysts of transformation. From fermenting grains into beer to enabling plants to colonize land, fungi inspire profound shifts. **Inspirational leadership** similarly acts as a catalyst, igniting belief, stirring action, and reframing what is possible.

Hyphae inspire through their perseverance and invisible ingenuity. Their ceaseless quest to grow, adapt, and connect models the energy that inspirational leaders embody. True inspiration does not come from dominance but from resilience, creativity, and the quiet demonstration of what can be achieved through steadfast commitment.

Moreover, fungi often alter the environment in ways that unlock the potential of others. Lichens, partnerships between fungi and algae, create new ecosystems where life once struggled to exist. Inspirational leaders, too, create fertile ground, environments where innovation, collaboration, and growth become possible. They transform barren landscapes into vibrant communities.

Finally, fungi remind us that inspiration can be subtle yet seismic. A single hyphal thread may seem insignificant, but woven into a network, it can shift the course of an entire forest. Leaders who inspire understand that small acts, repeated and magnified through networks, can lead to enduring change.

Growth, Transformation, and Inspiration: The Metamorphic Nature of Good Leadership

“Composers make; decomposers unmake. And unless decomposers unmake, there isn’t anything that the composers can make with.”[2]

The fundamental importance of this statement by Merlin Sheldrake in his wonderful book *Entangled Life* struck me as if I had been slapped in the face. Fungi, through their hyphal networks are in reality **‘change engines’**. They release and recycle capability and resources without which no new growth could occur. I believe mankind and particularly leaders in these turbulent times of change could learn a lot from this one statement.

One of fungi’s most extraordinary qualities is their ability to transform: decaying wood into fertile soil, toxins into harmless compounds, stale grains into intoxicating ale. Yeasts, those tiny fungal powerhouses, blurred the line between nature and culture long before humanity understood what fermentation even was.

Leadership is about creating change. At its best it is equally alchemical. It turns chaos into clarity, inertia into momentum, despair into hope. Like fungi, leaders often operate at the margins, at the edge of the known, testing new pathways, remaking structures, composting what no longer serves.

The decentralization of fungal networks also inspires. With no central brain, no command centre, fungi nonetheless coordinate complex behaviours. Leadership is often imagined as top-down, but fungal life suggests a different model: distributed intelligence, parallel processing, empowerment at the tips. In organizations, decentralization fosters resilience, creativity, and ownership.

Good leadership is not static; it is metamorphic. It evolves as circumstances change, just as a mycelial network remodels itself continuously. The part we humans struggle with is that we are fixated on the idea of constructing everything. Our role as metamorphic leaders is to create organisations that are more **organism-like**. Organisations with **plasticity** and constant growth and recycling as the default setting.

“In reality, organisms grow; machines are built. Organisms continually remake themselves machines are maintained by humans. Organisms self-organise; machines are organised by humans.”[2]

Summary

As humanity confronts complex, interwoven crises, the behaviours of our fungal friends offer us crucial lessons. Leadership must move from extraction to symbiosis, from control to collaboration, from rigidity to regenerative adaptation.

Fungi teach us that thriving systems are not built on domination but on negotiated relationships. That networks and what passes along them, matter more than nodes. That

resilience arises not from robustness but from flexibility. That decay is not the end but a prelude to renewal.

In the fungal world, nothing is wasted. No effort, no connection, no failure is lost. All is folded back into the living, breathing, ever-evolving system. Perhaps it is time we treated leadership, and ourselves, with the same wisdom.

Hyphae do not command attention; they command outcomes. They shape the world without needing to be seen. In their quiet perseverance, their fluid alliances, their capacity for both decay and creation, they reveal a model of leadership behaviour suited not for an age of empires but for an age of entanglement.

We still have so much to learn from the organic wisdom of hyphal networks. Their selfless, persistent behaviours show us that enduring leadership is not about imposing will, but about nurturing possibility, finding strength not in isolation, but in deep, meaningful interconnection.

If we can begin to model our leadership behaviours after the hyphae, patient, curious, symbiotic, and transformational, we may yet build organizations and communities capable of thriving not just despite complexity, but because of it. The future belongs to those who can lead not by force, but by fostering life itself.

Bibliography:

- [1] McKinsey In-house Leadership Development Team, "What is leadership?" McKinsey & Company Website Article.
- [2] M. Sheldrake, *Entangled Life: How Fungi Make our Worlds, Change our Minds, and Shape our Futures*. UK: Vintage, Penguin Randomhouse, 2021.