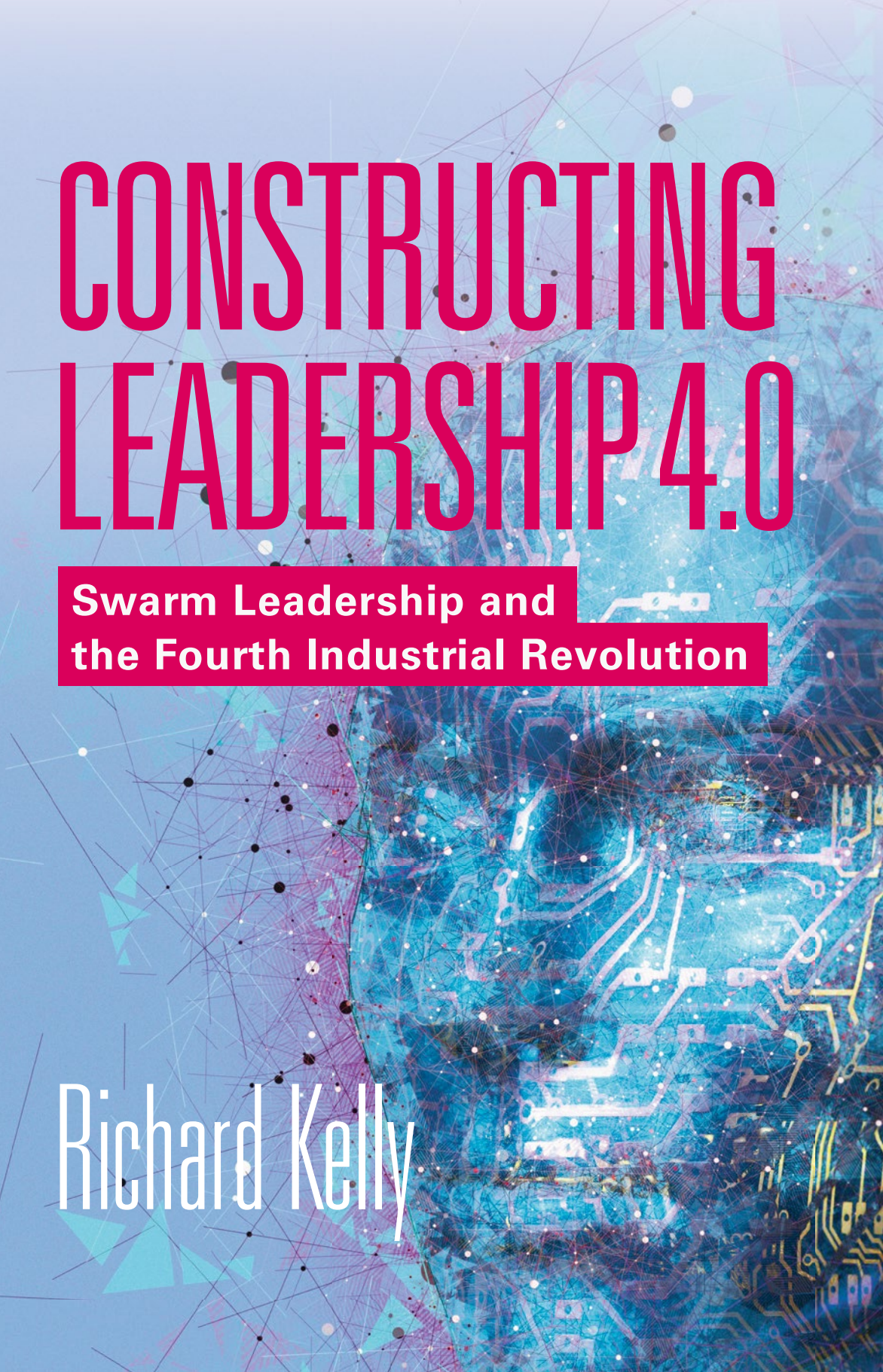

CONSTRUCTING
LEADERSHIP 4.0
Swarm Leadership and
the Fourth Industrial Revolution
Richard Kelly

Constructing Leadership 4.0

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Swarm Leadership and the Fourth Industrial Revolution

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To my father …

Preface

For a significant period of time now, I've been teaching organisational leaders tools, strategies, and techniques that, frankly, I don't believe work. For nearly half a century, we have recruited leaders direct from universities, assessed them for their leadership potential using US military techniques dating back to the mid-1900s, put them to work as managers, forced them through pipelines, pyramids, and frameworks, and packed them off to exclusive residential retreats to teach them charisma and how to influence people. After globally spending a reported 50–60 billion dollars a year on all of this, we are left scratching our heads wondering why so many of our emerging leaders don't quite live up to their leadership potential.

This situation has arisen because of our muddled approach to leadership and leadership development where we programme our leaders to be collective, and then stick them in outdated structures that reinforce positional power where followers revere their every word and decision. It's little wonder that we have so many burnt-out and confused executives who just can't cope with the pressure of being both servant leaders and corporate heroes.

As we edge closer towards a connected world, something has to change in the way we define leadership and the way we develop our leaders. This is the subject of *Constructing Leadership 4.0*. For years we have defined leadership in terms of charisma and control. This book takes its leadership inspiration from the natural world and the way insects, birds, and fish collectively organise themselves—a phenomenon known as swarm intelligence. We are entering into a fourth industrial revolution, a revolution that is heading towards hyper-connected consumers, machine intelligence, biotechnology, alternative sources of energy, and hyperspeed transport links, that is creating volatility,

transforming consumer behaviours, altering business and organisational landscapes, and challenging our perceptions of business leadership and LD.

Be under no doubt, our organisational lives will be very different in the coming years. Freelancing and cloudworking will be the norm and we will increasingly rely on machine intelligence in our daily work. The formal structured organisation will be slowly recast into connected ecosystems with collaborative networks that facilitate open innovation from varied stakeholders including internal resources, contractors, customers, partners, artificial intelligence, and competitors. Decisions and ideas will not come from a single source and may well not even come from a human source. We are getting to the point where products are ordered, dispatched, and delivered solely through abiotic systems—all supervised by robobosses. The future will be a self-adaptive, self-organising advanced cybernetic system, inspired by swarm intelligence.

The current model of leadership (relational, influence-based, processing, directive) will have no place in this future organisational world. Leadership will be a networked, collaborative, swarming, and responsive system. There will be a role for formal leadership, but it will not be instructing, directing, commanding, or deciding. It will be sensemaking, connecting, networking, nurturing, and harvesting. The self-adaptive, self-organising cybernetic system will not require the old leadership model or any of the methodologies of teaching it—the leader will be a responsive connector within a collaborative system. This, in essence, is Leadership 4.0.

The contention of this book is that traditional leadership development, based on organisational needs assessment and predetermined skills, knowledge, and competencies, is no longer an adequate preparation for the challenges that leaders will face in this volatile world. The book's emphasis is on cognitive readiness and a whole systems approach to developing leaders where developing leaders is not rooted in organisational programmes. It debunks the 40-year approach of developing leaders individually, which has created a culture of exclusivity, dependency, and superherodom. Therefore, the book will not contain any of the standard leadership tools found in more traditional studies.

Developing our future leaders will require a fresh pedagogical approach, away from classroom-centric behavioural training where leaders undergo transformational journeys that teach dependent-based personal mastery, decision-making, and influencing tools towards sensemaking, data-ism, collective intuition, and working with multiple biotic and abiotic intelligence. This shift from individual skills and competence-based training to vertical

growth and collective networked learning is best delivered through self-directed, technology-based networked learning.

This book, in essence, looks at how to shift the organisation towards an open ecosystem, how to build collaborative networks and encourage open innovation, and how to educate the entire leadership ecosystem to the new principles of collectiveness, collaborative thinking, and open innovation through self-directed virtual and networked learning.

Much has been written about the technological impact of Industry 4.0 in the form of a world dominated by servicing robots and driverless cars. Our everyday lives, according to these studies, will be very different in the coming years with Volocopters, Hyperloops, biochips, nanobots, care-o-bots, and the gentle hum of delivery drones and robotic pizza carriers. Few, however, are reflecting on the organisational and specific business leadership impact of this fourth industrial revolution that will shake over 100 years of established practice. Leadership development publications continue to write voluminously on relational leadership issues, employing cognitive-based models that influence, manage, and engage co-workers. This book, rooted in leadership development methodology, seeks to join a seminal group of publications that alert organisations to the immediate challenges ahead and the urgent and practical need to restructure the organisation and develop a generation of responsive and collaborative leaders based on swarm theory.

This book is based on 25 years of practical experience developing global leaders at all levels in the organisation as well as a solid PhD research background.

Kent, UK Richard Kelly

About the Book

The journey of the book goes from characterising Leadership 4.0, to defining a practical systems-based approach to developing leaders, and ending with a planned checklist of what organisations need to do to prepare their enterprise for Industry 4.0.

Chapter 1 is an introductory chapter that explores Leadership 4.0 in the broader theoretical context of leadership and leadership development. Using a timeline, the chapter examines the evolution of modern organisational leadership from the perspective of four pillars of learning (behaviourism, cognitivism, constructivism, and connectivism) and links these learning theories and pedagogies to the four phases of leadership behaviour (natural, directive, relational, and responsive). The chapter explores the role theory has played in shaping modern definitions and interpretations of leadership, and concludes that this new phase of leadership will require a clean break from traditional theories and pedagogies towards a theory of connectivism that promotes collaborative, swarm, and responsive leadership behaviours.

Chapter 2 demonstrates how leadership behaviour has historical links to organisational change brought about by macroeconomic and technological advancement. The eighteenth century witnessed the steam age revolution that led to the growth of centralised work and patriarchal leadership behaviours (Industry 1.0). The early twentieth century saw the discovery of oil and electricity to drive machinery and steel production, resulting in organised work and transactional leadership (Industry 2.0). The mid to late twentieth century heralded the computer, data, and digital age that decentralised the workplace and produced relational leaders (Industry 3.0). The chapter concludes with five major technological advancements—connectivity, transhumanism, machine intelligence, data-ism, alternative energies—that are connecting

consumers together in unprecedented ways and changing customer behaviour and organisational decision-making towards networked collaborative ecosystems and swarm leadership (Leadership 4.0). The chapter concludes that future leaders will need to be developed in different ways to prepare them for this new organising reality.

Chapter 3 sets up an organising framework for developing leaders. It starts with the story of a graduate entrant and her experience as an emerging leader in a traditional company. The chapter extracts seven key learnings from the story, pointing to the demerits of the traditional leadership development approach (the old model fixated on cognitivism, succession rite, management, measurement, transmission-based learning, horizontal development, and power). The chapter goes on to posit two key insights about leadership development of the future. First, that organisations need to adopt a whole systems approach to developing leaders including structures, connections, and mindsets. Second, future leadership development needs to break away from the organisational grip so that leaders can learn to be more adaptive and responsive. This is presented as horizontal versus vertical leadership development.

Chapter 4 examines leadership development from the point of view of organisational structure. It is the first part of a trio of chapters that explores three leadership behaviour influences—structure, mindset, and connections. The chapter opines that structure influences behaviour and profiles three dominant structures (each with examples and some case studies) that influence leadership behaviours in different ways: centralised/closed systems, decentralised structures, and open/ecosystems. Centralised systems condition behaviours and reinforce positional power. Decentralised systems are an effective way of centrally managing large organisations by devolving decision-making to teams and units and leading through relations. Future organisations will need to move towards open ecosystems which create a ripe environment for open collaboration and the free exchange of ideas and support responsive leadership where leaders are not conditioned by egocentric structures. The chapter provides some practical advice towards building these ecosystems.

Chapter 5 examines the role of connections and networks in constructing leadership behaviours. It is the second part of a trio of chapters that looks at a whole systems approach to developing leaders. The chapter profiles three types of organisational networks: centralised (egocentric), decentralised (social-centric), and distributed (open ecosystem). Taking inspiration from the way honeybees collaborate through waggle dancing before making a decision to migrate to a new nest, the chapter explores open/collaborative innovation as a way of innovating and collectively shaping ideas where communities of stakeholders swarm together, enabled by AI collaborative filtering tools. The chapter sets

out some basic principles of creating an open collaborative network. In this intersectional swarm ecosystem, the future leader will need to shift from being a director to a connector.

Chapter 6 examines leadership development from the perspective of educating mindsets and is the final part of a trio of chapters that looks holistically at the future development of leaders. The chapter advances the case that relational and influence-based categorisation tools taught mainly in classrooms are not fit for purpose in preparing our leaders for Industry 4.0 and the connected economy. The chapter proposes more collaborative related content that enables leaders to lead effectively in ecosystems and collaborative networks. Such content includes sensemaking, swarm intelligence, and raising the digital quotient. All of these approaches are supported with examples, case studies, and practical tools. The final part of the chapter addresses methodology. Formal classroom (transmission-based) learning should be replaced by vertical development and self-directed learning using learning management systems, where new technological learning approaches, such as virtual, mixed, and augmented reality, networked learning, and wearables, are adopted.

Chapter 7 is a checklist of what organisational decision-makers need to do *now* to prepare future leaders to be effective in Industry 4.0. Regarding structure, decision-makers need to remodel their organisations in an ecosystemic way by eliminating operant conditioning and cultivating internal and external collaborative networks using human and machine intelligence. The organisational structure needs to reinforce the leadership system. Regarding connections, departments need to be wired together to embrace the coming diversity of multiple stakeholders and human/machine resources. Data science, collaborative networks, and data infrastructure needs to be at the core of the organisation. Regarding mindset, a shift is required from horizontal to vertical development where leaders need to kick dependent models and learn how to be responsive and sensemaking connectors. Self-directed and technology-based learning is set to overtake more traditional methods. Traditional roles such as LD advisors are set to evolve into network enablers who support and stimulate self-directed leadership through learning management systems and networks. The chapter proposes a practical two-speed approach to change which focuses on eradicating conditioning structures, creating swarms and collaborative networks, merging divisions, and managing resources.

Owing to the technical nature of the study, a comprehensive glossary of terms used is located at the end of the book.

Finally, I wish to acknowledge the many students, participants, colleagues, clients, family members, and friends who have helped shape my ideas over the

years. Specifically, in relation to this book, I wish to give thanks to Peter Page, editor at Entrepreneur.com, for publishing my work and believing in me as an author, Dr. Benjamin Quaiser, Director, Business Development, Executive Education ESMT, Berlin, for a great interview on the work he is doing in virtual reality and executive education, Dr. Karen Stephenson at Netform for supplying me with some articles and sources, Dave Snowden, founder and Chief Scientific Officer at Cognitive Edge, for giving me personal permission to use a visual of the Cynefin Framework, Dr. Susanne Cook-Greuter for granting me permission to quote from her online work, and Dr. George Siemens for graciously agreeing to peer review my book proposal to Palgrave Macmillan. A special thanks to my 83-year-old father and the amazing conversations we have had about robots and the future of civilisation.

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Richard Kelly, 2018

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Abbreviations

AI	Artificial Intelligence
AR	Augmented Reality
B2C	Business to Consumer
CBET	*Competence*-Based Education and Training
CoIN	Collaborative Innovation Networks
CQ	Collaborative Intelligence
CSI	Change Style Indicator
DQ	Digital Quotient
ESMT	European School of Management and Technology
GCC	General Company Circle (Holacracy)
HiPo	High Potential
IMG	International Management Group
I/O	Industrial and Organisation Psychology
IOT	Internet of Things
IR4	Industrial Revolution 4.0
KPIs	Key Performance Indicators
L&D	Learning and Development
LD	Leadership Development
LMS	Learning Management System
MBTI	Myers Briggs Type Indicator
MDF	Multi-Divisional Form
MR	Mixed Reality
NL	Networked Learning
P&R	People and Resources
P&P	Platform and Processes
S&E	Strategy and Execution
SBU	Strategic Business Unit
SDL	Self-Directed Learning

SNA	Social Network Analysis
SVP	Senior Vice President
TED	Technology, Entertainment and Design
TQM	Total Quality Management
U-form	Unity Form Structure
VTOL	Vertical Take-Off and Landing
VR	Virtual Reality
VUCA	Volatile, Uncertain, Complex, Ambiguous

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1

Introductory Chapter: Towards Leadership 4.0

On Super Bowl Sunday in 2017, Uber Black driver Fawzi Kamel realised he had a special passenger in the back of his car. It was Uber co-founder and CEO Travis Kalanick. Kamel used the opportunity to confront Kalanick about Uber Black's pricing structure for the premium service, claiming Uber's pricing model was bankrupting him. A dashcam video recorded Kalanick firing abuse at the driver. 'Some people don't like to take responsibility for their own shit,' Kalanick exclaimed as he piled out of the car. 'They blame everything in their life on somebody else.' The heated exchange went viral on social media, prompting an apology from Kalanick in an email to his staff that was published on the Uber Newsroom blog where he said, 'I must fundamentally change as a leader and grow up. This is the first time I've been willing to admit that I need leadership help and I intend to get it.'[1] Travis Kalanick didn't get a chance to become a better Uber CEO, he resigned from his post in June 2017 following mounting pressure from investors who viewed him as a liability because of his pugnacious leadership style and controversial lifestyle.[2]

This episode came at the tail end of a string of high-profile CEO resignations. Toshiba's Hisao Tanaka quit over the Toshiba Corp accounting scandal. Volkswagen's Martin Winterkorn resigned because of the Volkswagen emissions scandal and now faces criminal charges. Third Avenue Management's David Barse was escorted from the building over a credit fund collapse debacle.[3] Each of these CEOs was described as being 'tough as nails', demanding, and blunt, which sparked news commentary that their dissonant and coercive leadership style contributed to a culture of suppressing bad news which led to the organisations' disclosure problems.

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R. Kelly, *Constructing Leadership 4.0*, https://doi.org/10.1007/978-3-319-98062-1_1

Something curious is happening in the world of leadership and leadership development today. Research reported in the *Financial Post* states that two out of five new CEOs fail in their first 18 months on the job, which 'has nothing to do with competence, knowledge, or experience, but rather with hubris and ego and a leadership style out of touch with modern times.'[4] Such dissonant leadership styles have led to a culture that intimidates coworkers, deters transparency, kills self-reliance and innovation, delays decision-making, creates unnecessary bottlenecks, decreases motivation and productivity, and drains the organisation of its talent.

Organisations' annual spend on leadership development is approximately $4000 per person[5] with studies pointing to a global organisational spend on LD in excess of $50 billion a year[6]; and, yet, recent research suggests that this huge investment is not paying dividends:

- A 2015 Deloitte study revealed that $40 billion of the annual global spend was squandered, despite 86% of organisations identifying leadership as business critical.[7]
- A 2015 Gallup study, which surveyed 7272 US adults, revealed that 50% had left a job because of poor management or leadership issues.[8]
- A 2015 Grovo study estimated that $13.5 million was lost each year per 1000 employees as a result of ineffective L&D interventions.[9]
- A 2016 Harvard Business State of Leadership report revealed that only 7% of surveyed companies considered their leadership programmes to be best in class.[10]

The state of organisational leadership seems more uncertain and discordant than at any time in its relatively short history, and throwing large sums of money at it is not improving things; it simply contributes to what Beer, Finnström, and Schrader term in their *Harvard Business School* working paper as 'the great training robbery'.[11] This book seeks to address this leadership gap, a gap that aspires towards effective leadership, but has lost its way regarding how to attain it. To echo James MacGregor Burns, 'If we know all too much about our leaders, we know far too little about *leadership*. We fail to grasp the essence of leadership that is relevant to the modern age and hence we cannot agree on the standards by which to measure, recruit, and reject it … Leadership is one of the most observed and least understood phenomena on earth.'[12]

This leadership gap has been compounded by the plain fact that we are transitioning to a new social and economic world order brought about by new technologies. These new clusters of emerging technologies, collectively contributing to Industrial Revolution 4.0 (IR4), are changing consumer expectations,

needs, and habits, destabilising political certainties, and wrong-footing organisations by exposing their arrogant attitudes, disjointed structures, secretive practices, directive leaders, and sycophantic followers.

We need to create a leadership that is fit for purpose for this new technological wave. This leadership is being called Leadership 4.0 and it has evolved from previous versions of leadership.

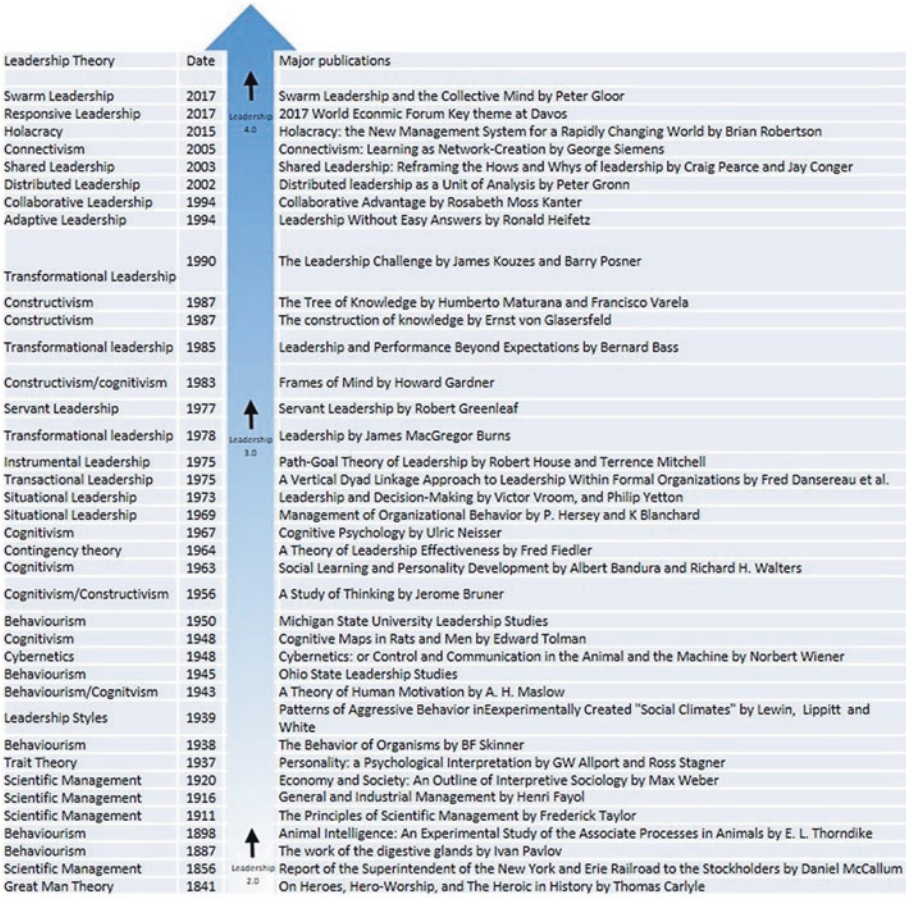
This chapter explores the nature of Leadership 4.0 via a brief Western-centric timeline of business leadership and LD. The timeline charts the different actors, theories, and characteristics of business leadership and examines how organisations have developed leaders over the decades.

Timelines are awkward instruments—more intriguing for what they leave out rather than for what they contain. That said, they are a useful way of capturing trajectories and trends. This chapter will not be able to exhaust the entire history of leadership development and will restrict itself to four core pillars of learning that have helped shape and define leadership and LD. Such a timeline can help us review what has gone on in the past and extrapolate future trends—as Winston Churchill remarked in a 1944 speech, 'The longer you can look back, the farther you can look forward.'[13] It will also serve as an orientation or compass to be carried through the book's journey (Fig. 1.1).

The Four Pillars of Learning and the Elephant in the Room

There are four sequential learning theories that support this timeline period which are crucial background to this book. A simple way to think about these pillars of learning is via the parable of the blindfolded men and the elephant. This is a parable that originates in text form from Buddhist scripture, but has been widely used in other religions and contexts throughout the centuries. The story goes that six blindfolded men were asked to examine different parts of an elephant in order to understand the nature of an elephant. Here are their insights:

'The elephant is a tree,' said the first man who touched its leg.
'Oh, no! It is like a rope,' retorted the second after touching the tail.
'Goodness, it's a live snake,' the third man said recoiling back after touching the trunk.
'Nonsense! It is a big fan,' said the fourth man feeling the ear.
'I think it is more like a huge wall,' opined the fifth man who groped the belly.
'Are you all dumb?' exclaimed the sixth man with the tusk in his hand 'An elephant is clearly some kind of spear.'



Leadership Theory	Date	Major publications
Swarm Leadership	2017	Swarm Leadership and the Collective Mind by Peter Gloor
Responsive Leadership	2017	2017 World Econmic Forum Key theme at Davos
Holacracy	2015	Holacracy: the New Management System for a Rapidly Changing World by Brian Robertson
Connectivism	2005	Connectivism: Learning as Network-Creation by George Siemens
Shared Leadership	2003	Shared Leadership: Reframing the Hows and Whys of leadership by Craig Pearce and Jay Conger
Distributed Leadership	2002	Distributed leadership as a Unit of Analysis by Peter Gronn
Collaborative Leadership	1994	Collaborative Advantage by Rosabeth Moss Kanter
Adaptive Leadership	1994	Leadership Without Easy Answers by Ronald Heifetz
Transformational Leadership	1990	The Leadership Challenge by James Kouzes and Barry Posner
Constructivism	1987	The Tree of Knowledge by Humberto Maturana and Francisco Varela
Constructivism	1987	The construction of knowledge by Ernst von Glasersfeld
Transformational leadership	1985	Leadership and Performance Beyond Expectations by Bernard Bass
Constructivism/cognitivism	1983	Frames of Mind by Howard Gardner
Servant Leadership	1977	Servant Leadership by Robert Greenleaf
Transformational leadership	1978	Leadership by James MacGregor Burns
Instrumental Leadership	1975	Path-Goal Theory of Leadership by Robert House and Terrence Mitchell
Transactional Leadership	1975	A Vertical Dyad Linkage Approach to Leadership Within Formal Organizations by Fred Dansereau et al.
Situational Leadership	1973	Leadership and Decision-Making by Victor Vroom, and Philip Yetton
Situational Leadership	1969	Management of Organizational Behavior by P. Hersey and K Blanchard
Cognitivism	1967	Cognitive Psychology by Ulric Neisser
Contingency theory	1964	A Theory of Leadership Effectiveness by Fred Fiedler
Cognitivism	1963	Social Learning and Personality Development by Albert Bandura and Richard H. Walters
Cognitivism/Constructivism	1956	A Study of Thinking by Jerome Bruner
Behaviourism	1950	Michigan State University Leadership Studies
Cognitivism	1948	Cognitive Maps in Rats and Men by Edward Tolman
Cybernetics	1948	Cybernetics: or Control and Communication in the Animal and the Machine by Norbert Wiener
Behaviourism	1945	Ohio State Leadership Studies
Behaviourism/Cognitvism	1943	A Theory of Human Motivation by A. H. Maslow
Leadership Styles	1939	Patterns of Aggressive Behavior inExperimentally Created "Social Climates" by Lewin, Lippitt and White
Behaviourism	1938	The Behavior of Organisms by BF Skinner
Trait Theory	1937	Personality: a Psychological Interpretation by GW Allport and Ross Stagner
Scientific Management	1920	Economy and Society: An Outline of Interpretive Sociology by Max Weber
Scientific Management	1916	General and Industrial Management by Henri Fayol
Scientific Management	1911	The Principles of Scientific Management by Frederick Taylor
Behaviourism	1898	Animal Intelligence: An Experimental Study of the Associate Processes in Animals by E. L. Thorndike
Behaviourism	1887	The work of the digestive glands by Ivan Pavlov
Scientific Management	1856	Report of the Superintendent of the New York and Erie Railroad to the Stockholders by Daniel McCallum
Great Man Theory	1841	On Heroes, Hero-Worship, and The Heroic in History by Thomas Carlyle

Fig. 1.1 Leadership timeline

Some versions of the story describe the six self-proclaimed experts arguing about the nature of an elephant until somebody intervenes and explains that they are feeling different parts of the same beast.

What does this simple story tell us about how we acquire knowledge and meaning? Let's briefly consider it through the four pillars of learning: behaviourism, cognitivism, constructivism, and connectivism[14] that have shaped and continue to shape definitions of modern leadership and LD.

The parable seen through the lens of behaviourism is one of sensory experience. To understand the elephant in the room, the blindfolded men have physical contact with it—they touch it, they climb on it, they measure it.

They arrive at their conclusions through experimentation, observation, and sensing. Behaviourism was a dominant theory in the 1940s, which posited that we do not have innate and predetermined behavioural traits—which was the predominant nineteenth and early twentieth century view popularised by Thomas Carlyle's great man theory and Allpot and Stagner's trait theory of personality[15]—but that we are conditioned by environmental and external factors. The key principle behind behaviourism is a posteriori knowledge, based upon experience, especially through sensory perception. This forges links between behaviourism and empiricism, which connects to Aristotle[16] and continues through the philosophy of John Locke and others.[17] Early pioneers of scientific behaviourism include Ivan Pavlov, John Watson, and Edward Thorndike.[18] B.F. Skinner expanded Thorndike's cause and effect research by seeking to understand behaviour through causes and consequences.[19]

Behaviourism had a dramatic impact on developing leaders. It promoted the idea that leadership was not an innate quality, but a behavioural transaction between leader and follower. Here, leadership is seen as a supervisory and conditioning set of behaviours. The debunking of the idea of innate forms of behaviours and individual traits paved the way for twentieth-century practices in programmatic conditioning, teaching, and training leaders based on generic scientific assumptions of human behaviour. Leadership development borrowed unstintingly from the behaviourist research that was burgeoning in the field of education and learning, particularly the US military in the 1950s where the US became concerned about the quality of leadership among non-commissioned officers and employed some of the emerging personality and behavioural competence studies to assist them in their recruitment. Behaviourism was also used in the emerging industries. A key development in workplace behaviourism was the self-categorisation of leadership through generic styles and situations rather than individual traits. Four important studies in behavioural leadership styles from the period include K. Lewin et al., the Ohio State leadership studies, the Michigan studies, and Robert Tannenbaum's leadership patterns.[20] These early leadership style models were trying to establish the behavioural consequences that default leadership styles had on followers and sought to improve the transaction between leaders and followers. Two transactional models from the period include the path-goal model and situational leadership.[21] These early leadership tools bridged the divide between directive and relational behaviours, indicating that leaders should not only be aware of different styles of leadership, but also be aware of how situations influence leadership choice.

Another key aspect of behaviourism is the idea that behaviour is measurable and quantifiable.[22] From the 1950s onwards, industrial training and development began to be monitored and assessed.[23] The 1920s also saw a steady shift towards competency-based behavioural training. Eric Tuxworth writes, 'The competency based movement, under that label, has been around for 20 years or more in the US. Its origins can, however, be traced further back to the 1920s, to ideas of educational reform linked to industrial/business models centred on specification of outcomes in behavioural objectives form. From the mid-1960s onwards the demand for greater accountability in education, for increased emphasis on the economy, and towards community involvement in decision-making gave a great impetus to the concept of CBET.'[24] These measurement tools were used by leaders as transactional and personal development instruments. These behaviourist legacies and transactional approaches of conditioning, transacting, and measuring are still taught on leadership development programmes today and are widely employed across organisations.

The parable seen through the eyes of cognitivism is one of mentalism. Having felt the elephant, the blindfolded men compute and rationalise the nature of an elephant and build a mental picture of it. Their idea of the elephant ('it's a rope,' 'it's a snake,' 'it's a tree,' and so forth) is based on inner association and processing taken from a mental library of knowledge and experience. Once they have cognitively formulated a view, it becomes a personal truth to them.

Cognitivism was the dominant learning pedagogy of the 1950s. Cognitive theorists suggest we 'view learning as involving the acquisition or reorganization of the cognitive structures through which humans process and store information'.[25] This is attained through association. Cognitivists believe that behaviours and performance are improved through inner rationalisation as opposed to behaviourists who believe that behaviours and performance are dependent on empirical situations, structures, and environments. Cognitivism continues in the tradition of Plato's rationalism where the 'real world' is internalised.[26] Cognitivism came about as a reaction against behaviourism, which advocated that the human mind was a 'black box' where internal processes cannot be observed and known. Cognitivism asserts that internal mental processes can be examined, and views human behaviour as an underlying consequence of such a mental and cognitive process.[27]

Cognitive leadership carries the assumption that ideas, intelligence, intuition, experience, and other cognitive functions are critical factors in leadership success. It is assumed that only leaders with cognitive capacity have the ideas, intelligence, vision, and mindset to be effective leaders. This is reflected in the cognitive theories by Fred Fiedler and Robert Katz who argue that intelligence and acquired knowledge/skills are key to leadership perfor-

mance.[28] The idea of personal and organisational effectiveness using cognitive frameworks was popularised by Chris Argyris and Donald Schön, Stephen Covey, and Peter Senge and became a key leadership approach throughout the late 1980s and 1990s where leaders were invited to explore their own vision, values, defining moments, mental models, assumptions, and inner dialogue.[29] Leaders cognitively reconfigured their own dissonant leadership behaviours in order to engage and inspire others and became personal change agents within the (learning) organisation. Cognitivism and early cognitive constructivism resulted in leaders that were more introspective. Cognitive leaders do not believe that performance is enhanced through rewards and stimuli-response, but through engagement and motivation.[30]

This era of cognitivism led to the formal cognitive training of leaders. In large organisations, cognitivism tended to favour the more cerebral programme and curriculum-based classroom learning environments. Cognitivism also had a profound effect on programme design—in cognitivism, the programme design was structured and sequenced in a brain enhancing way using cognitivist techniques that added logical flow to enhance the learning.[31]

Cognitivism had a very big impact on leadership. It led to Leadership 3.0 and a generation of introspective and relational leaders which nudged the leader/follower dynamic beyond classic conditioning. It has also led to an organisational prejudice that leadership is a cerebral activity and that leaders, therefore, should be recruited from elite universities and trained in classroom settings using transmission-based learning methods. This book seeks to challenge this mindset as we move towards ecosystems and collaborative networks.

If the blindfolded men were constructivists, they would construct/build a view of the elephant through dialogue and shared understanding. Constructivism, dominant in the 1960s, is the belief that reality and learning is an ever-evolving subjective interpretation of the world[32] that derives from experience and context and that knowledge and meaning are actively built/constructed through internal or social negotiation. It raised the awareness of followship and relationalism. It has two main branches: cognitive and social. Cognitive constructivism, as seen in the works of Jean Piaget, Howard Gardner, Jerome Bruner, Humberto Maturana and Francisco Varela, and Ernst von Glasersfeld, is rationalist in flavour, believing that knowledge and understanding is internally constructed and built through internal mental processes.[33] Social constructivism, as seen in the works of John Dewey, Lev Vygotsky, Peter Berger and Thomas Luckmann, and Kenneth Gergan, believes more in social interaction/relations where reality is socially constructed.[34]

Constructivism brought two innovative approaches to leadership development. The first is in the cognitive constructivist camp, which has to do with

building internal ideas and making sense of the world. Jerome Bruner's work on self-discovery and ways of worldmaking are relevant here, as well as Malcolm Knowles' theories of andragogy and self-directed learning, where the learner internally constructs knowledge. This has led to a generation of reflective and self-improving leaders.[35]

The second innovative approach to leadership development is in the social constructivist camp and considers leadership as a social construction.[36] Constructivist leaders seek to build meaning and understanding through shared mental and social collaboration; because of this, they are collaborative and inclusive enablers who respect diversity of culture, thought, and ideas. They actively seek out alternative approaches, are reflective and responsive, invite and facilitate discussion, acknowledge the input of others, foster mutual respect, and build shared vision and common purpose. Social constructivism accommodates social learning theories and transactional learning and radicalised the approach to developing leaders both in and outside of the classroom environment. Albert Bandura published his social learning theory, which is often cited as a bridge between cognitive and behaviourist theory, which promoted observational and socially mediated learning which paved the way for such learning initiatives as mentoring, workplace learning, early leadership assignments, and job shadowing.[37] Social constructivism championed moving learning and development out of the classroom setting and into the field—building experience and knowledge for constructivism isn't just a cerebral activity, it involves building knowledge through social interaction in the real-world environment. The social learning movement led to a radical reappraisal of leadership development where leaders were developed either outside of classroom settings or in a 'blended learning' environment where formal classroom training is blended with social learning. Social constructivism also radicalised the classroom experience—it shifted the experience from purely transmission-based learning where the active facilitator-teacher is the locus of authority and transmits knowledge to passive learners, to a learner-centric activity where the locus of authority does not rest with the facilitator, but with the self-discovering learner.[38] Self-discovery learning plays a key part in constructivist classroom environments where the learner has greater interaction with the material through such things as facilitated discussion, plenaries, breakout sessions, debriefed business simulations, case studies, and the use of the environment and learning preferences to enhance learning.[39] Programmatic interventions are more powerful when the line is involved (especially at the pre and post stage of the learning programme). Typically, organisational leaders will form part of the faculty (creating a leader-developing-leader culture common in such organisations as GE). Applying

the learning back to the workplace via such things as workplace assignments is also a key part of the constructivist approach.

Constructivists influenced leadership by placing greater emphasis on social context and interaction that highlighted the importance of followship and produced a generation of relational leaders who understood the modern notion of enablement, collaboration, and delivering results through others. It also influenced the way leaders were developed shifting the emphasis away from theory-based leadership development transmitted in classrooms to social and experiential-based leadership development, exercised through blended and work-based learning.

If the blindfolded men were connectivists, they would leave the room, fire up their computers, and surf for knowledge of the elephant through search engines, webpages, blogs, networks, and community groups. The elephant is no longer in the room; it is all over social media. There is one problem with both the cognitive and constructivist approaches.

There is an assumption that knowledge is acquired through internal mental processes. Connectivists believe that knowledge acquisition is not just a mental process, but 'out there' in networks, databases, blogs, and the like. Our ability to access data and information is just a click away, and the technology to process information improves every year with more powerful search engines, networks, and AI technology. This subject will be explored in later chapters. In traditional learning, the learner actively seeks out the solution. In the connectivist age of network and bots, information comes to the learner and sometimes even seeks the learner out. George Siemens, who coined the term connectivism, writes in his seminal article, *Connectivism: A learning theory for the digital age*:

> Learning is a process that occurs within nebulous environments of shifting core elements—not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing.[40]

Siemens views behaviourism, cognitivism, and constructivism as pre-internet learning theories that have as a central premise the idea that knowledge and learning is an 'internal individualistic study'.[41] Connectivism, on the other hand, promotes the idea that 'knowledge is distributed across a network of connections'[42] which is based on 'rapidly altering foundations.'[43] To paraphrase Siemens, connectivism is a twenty-first century solution for a twenty-first century occurrence of chaos, displaced networks, complexity, self-organising theories, and non-human storage of knowledge and intelligence. Its listed core principles are:

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialised nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.[44]

Connectivism rejects the idea of the 'sage on the stage', favouring digital alternatives and networked learning. This raises the importance of connecting with people though network sites, blogs, and other forms of online commentaries. Connectivism places value on serendipity and knowledge finding you. Stephen Downes argues that connectivism has 'no real concept of transferring knowledge, making knowledge, or building knowledge. Rather, the activities we undertake when we conduct practices in order to learn are more like growing or developing ourselves and our society in certain (connected) ways.'[45]

The connectivist leader is a highly connected, resourceful, collaborative and networked individual. Their key skill is to connect people with ideas, resources and contacts, to discover displaced information and data, and to be a prominent online influencer who is sought out by others. A connectivist leader will focus on the flow of information within organisations. They are not precious about ideas and are committed to open innovation and open sourcing.

Leadership One … Two … Three … Four

Formal business leadership development is a recent occurrence. There is, however, a rich premodern canon of texts—more generally termed 'mirror for princes'—in the instruction of military, political, and monarchical rule. Figure 1.2 captures the diversity of early leadership texts.

There have been three dominant leadership phases since the Industrial Revolution and we are now edging into a fourth (Fig. 1.3).

China	Lao Tzu - *Tao. Te Ching* (6th Century BC) promotes non-interventional and compassionate leadership. Sun Tzu - *The Art of War* (circa 5th Century BC) is a manual on strategic leadership in warfare.
India	Kautilya - *Arthashastra* (4th-3rd Century BC) sets out core values attributes and behaviours of leadership when running an administration.
Greece	Plato - *The Republic* (5th Century BC) is a philosophical treatise on creating and maintaining the just society that includes the attributes and training of elite, specially educated guardian-leaders. Xenophon - *Cyropaedia* (5th Century BC) is a fictional biography of *Cyrus The Great* that includes the education, values and behaviours of leadership.
Roman	Plutarch - *Lives* (2nd century AD) which looks at the leadership traits of contemporaneous Roman leaders Suetonius – (AD 121) *The Twelve Caesers*. The Medieval period, of course, gave us such as texts as Machiavelli's *The Prince* (1532 AD)

Fig. 1.2 Early leadership texts

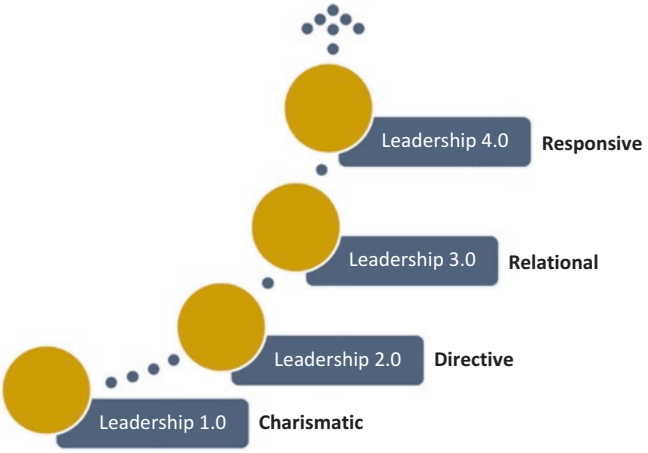


Fig. 1.3 The four phases of leadership

Leadership 1.0

Leadership 1.0 was charisma-led. In *The Theory of Social and Economic Organisation*, Max Weber provides a classic definition of charisma:

> Charisma is a certain quality of an individual personality by virtue of which he is set apart from ordinary men and treated as endowed with supernatural, superhuman, or at least specifically exceptional powers or qualities. These are such as are not accessible to the ordinary person, but are regarded as of divine origin or as exemplary, and on the basis of them the individual concerned is treated as a leader.[46]

This is a continuation of a set of beliefs that link back to Aristotle's *Politics,* where Aristotle considers the innate qualities of the naturally gifted leader (charisma is Greek for 'gift'). Aristotle writes, 'From the moment of their birth, some are marked for subjugation and others for command.'[47] Thomas Carlyle continues this tradition of the natural born leader in his great man theory in the nineteenth century, which promotes hereditary leadership and is a throwback to the studies of Roman lives.[48] This idea of the natural born leader was widespread in the mills and factories from the late eighteenth century through to the late nineteenth century where the military term 'captains of industry' was coined by Thomas Carlyle in his 1943 book, *Past and Present*. Charisma has shaped the way we recruit, develop, and promote leaders for over 100 years.

Leadership 2.0

Leadership 2.0 is the era of scientific management. We saw earlier how behaviourism denounced the theory of innate forms of personality and shifted the thinking from individual traits to psychological patterns of behaviour. Commentators such as Herbert Spenser thought the great man theory was unscientific believing individuals to be shaped by their social environment.[49] In *The Creative Experience*, management thinker, Mary Parker Follett, directly challenged the heroic leadership model:

> The pregnant question for the social scientist becomes, then, whether we are to be ruled by the desires of the strongest, whether we are to live in a Power-Society, or whether there is any process possible by which desires may interweave.[50]

The US railway industry, which was one of the first large-scale employers outside of the military, started to think about how to manage and lead people through a more scientific and process-driven approach. Daniel McCallum, general superintendent of the New York and Erie Railway, created the first known organisational chart and produced some general principles of management that supported top-down command and control leadership.[51] George Leonard Vose supplemented this thinking by insisting that subordinates are managed by direct superiors.[52]

Early twentieth-century scientific management theorists, including Frederick Taylor, Henri Fayol, and Max Weber, were all preoccupied with maximising efficiency and productivity.[53] Taylor skipped Harvard University to work on the shop floor at Enterprise Hydraulic Works in Philadelphia. It was through his observations of the workers that he devised his theories of productivity and standardisation:

> It is only through *enforced* standardization of methods, *enforced* adoption of the best implements and working conditions, and *enforced* cooperation that this faster work can be assured. And the duty of enforcing the adoption of standards and enforcing this cooperation rests with *management* alone.[54]

His scientific approach, which was one of the first methods of organised work, made tremendous savings for the company and he went on to become one of the first management consultants. He also believed in top-down authority. Victor Lippit quotes one of Frederick Taylor's employees, Charles Shartle, who reported that Taylor once said to him, 'I have you for your strength and mechanical ability. We have other men paid for thinking.'[55]

Leadership 3.0

Since the late 1970s, various studies and discussions relating to transformational leadership have been produced calling for a more engaged leadership where the leader builds a meaningful relationship with the follower. The term transformational leader was coined by James Downton in 1973,[56] but came into currency five years later with the publication of James MacGregor Burns' 1978 seminal text, *Leadership*. Until this point, behaviourism and many of the leadership development models and tools encouraged leaders to transact with followers. Transaction is about exchange and control—Bass et al. say, 'A leader is transactional when the follower is rewarded with a carrot for meeting agreements and standards

or beaten with a stick for failing in what was supposed to be done.'[57] Transformational leadership, as described by James MacGregor Burns, has a moral dimension where 'the transforming leader looks for potential motives in followers, seeks to satisfy higher needs, and engages the full person of the follower. The result of transforming leadership is a relationship of mutual stimulation and elevation that converts followers into leaders and may convert leaders into moral agents.'[58] This fresh approach to leadership, which coincided with constructivism, led to a more collaborative and engaged relationship with followers. It also led to a series of important publications on engaging with followers including Bernard Bass, Warren Bennis and Bert Nanus, Edgar Schein, Jim Kouzes and Barry Posner, Noel Tichy and Mary Anne DeVanna, Ron Heifetz, and Bernard Bass and Bruce Avolio.[59]

One of the things that is implicit in this study is that transformational leadership has failed to move beyond an aspiration. The culture of transactionalism and coercive leadership has been pervasive. The training industry over commercialised transformational leadership with trademark cognitive models, tools, and frameworks which undermined genuine attempts to create a more meaningful (even spiritual) connection between leader and follower. Transformationalism became subsumed by theories of influence such as expressed by distinguished commentators as John Maxwell.[60]

This book focuses on the top of the timeline, in the area of responsive and swarm leadership and the learning theory of connectivism. This is an under researched field which is gathering interest at conferences (such as the world economic forum), publications, and in organisations such as Typeform and Daimler AG that are profiled in Chap. 4. The next six chapters take a deep dive into this area of the timeline and explores how we can work these emerging theories into a practical solution to plug the leadership gap that we are currently experiencing. It will mean reimaging leadership away from being a relational and influence-led occurrence (Leadership 3.0) that is spiked with directive legacies (Leadership 2.0), towards thinking about leadership as a responsive and swarm system that operates at a systemic level and takes the uncertainty and volatility of IR4 in its stride. The book is also a practical handbook about how we can prepare our leaders and our organisations for Leadership 4.0 and this new economic order of hyperconnectivity, data-ism, and machine intelligence. Before jumping into these various systems of leadership and LD, let's define swarm and responsive leadership.

The Nature of Leadership 4.0

In later chapters, this book will explore the organisational habits of ants, honey bees, and termites to gain insights about how these natural systems inform organisational design and leadership. For now, let's look at the queen bee as a model for future leadership. The curious thing about the queen bee is that she does not directly control the colony. She replenishes, reproduces, and nurtures the hive. The colony supports her—the worker bees raise the new queen and they can also replace her by killing her off.

Leadership of the future is not going to be about status, positional power, control, and rank—which is part of the culture of 'imperial leadership' and charisma.[61] Leaders will not call the shots or be the sole executive decision-makers or idea generators. Ideas, decisions, and innovation will come through open collaboration and collaborative networks. This is going to take some organisational restructuring, some collaborative network designing, and some radical changes in individual mindset. This book explores how this can be achieved through a whole systems approach to developing leaders.

Swarm leadership is an adaptive, emergent, connected, responsive, and collaborative model that belongs broadly in the category of collective leadership. It differs from distributed or shared leadership.[62] Distributed leadership has been influential in the schools and education sector, primarily through the publication of Peter Gloor, James Spillane, and others[63] and is about group relationships[64] and the 'interactions between leaders and followers'.[65] Deborah Ancona and Elaine Backman call it a 'balance between networks and individuals, personality and practices, and freedom and control.'[66] Shared leadership is more common in organisations. Craig Pearce and Charles Manz provide a classic definition:

> Shared leadership occurs when all members of a team are fully engaged in the leadership of the team: Shared leadership entails a simultaneous, ongoing, mutual influence process within a team, that involves the serial emergence of official as well as unofficial leaders. In other words, shared leadership could be considered a case of fully developed empowerment in teams.[67]

As Richard Bolden observes, there is a common thread to these collective theories, 'Common across all these accounts is the idea that leadership is not the monopoly or responsibility of just one person, with each suggesting a similar need for a more collective and systemic understanding of leadership as a social process.'[68]

Shared and distributed leadership models are different from swarm leaderships. They still belong to the category of influence-led models that merely redistribute and devolve centralised power from leaders to followers. Swarm leadership is part of a self-organising complex adaptive system—it is a collaborative networked effort that adapts and self-organises (rather than self-manages) in the moment, swarming in on a task or challenge and collectively innovating, organising, and collaborating. Leadership in this context needs to be responsive to the overall system. Responsive leadership a theme at the 2017 World Economic Forum at Davos, literally means to respond to situations in an intentionally adaptive way.

This chapter has pinpointed a leadership gap that is getting wider despite being patched up with billons of corporate training dollars. There is a disconnected train where organisations are out of synch with the connected world. This book seeks to narrow this gap by redefining leadership as a swarming collective system rather than a group of elite superheroes sitting at the top. It considers leadership development in terms of structures, networks, and mindsets. In this chapter, we explored leadership in a theoretical context spread over four pillars of learning and four distinct leadership phases. The next chapter examines leadership in a socioeconomic context.

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2

Making Connections

There's a nice moment in Voltaire's *Candide* when three companions, Candide, the celebrated Professor Pangloss, and Martin, an aspiring philosopher, are walking together listening to the erudite professor sermonising about the nature of power and glory on the way to do some work in their garden. Martin interrupts the professor's flow. 'Let us work without theorizing,' he says, 'tis the only way to make life bearable.'[1] This seems sound advice. In the previous chapter, the sketched phases of leadership were linked to timelines, pedagogies, theories, and publications. This may leave the impression that organisational leadership throughout the ages was shaped by theorists. Most business leaders who have had experience with leading organisations know that this isn't quite right. Although leadership development was undoubtedly shaped by theory, leaders themselves are shaped by many factors—by organisations, by peers, by economic circumstances, by life experience, by family members and mentors. The list goes on. Our lives 'are like islands in the sea, or like trees in the forest,' writes William James, everything is connected 'in the darkness underground' or 'through the ocean's bottom'.[2]

In his seminal book, *On Leadership*, published nearly 30 years ago, John Gardner famously wrote, 'Leaders cannot be thought of apart from the historic context in which they arise, the setting in which they function … and the system over which they preside.'[3] Two key insights from John Gardner's point of view inform this chapter: that workplaces are systems, and that these systems shape leadership behaviour. This chapter will take a practical look at three symbiotic systems that shape everyday leadership: the socio-economic environment, the rise of the organisation, and business leadership behaviour.

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As we saw in the previous chapter, the last 300 years or so has produced three major industrial and organisational revolutions that have come about through the discovery of new energy supplies and technologies which power machinery.[4] This has instigated a shift toward centres of production and organised workplaces. The business leader emerged within this context as organisations evolved from single factories governed by patriarchal owners to the rise of modern business leaders and managers within complex systems. The following sections take a historic look at each major industrial revolution in terms of the organisational impact and how business leadership emerged and evolved within this context. This section will also look ahead to the emerging fourth industrial revolution and the likely impact on future organisational structure and leadership behaviour. Taking this systems and holistic approach to organisational leadership will help us anticipate how we develop future leaders.

Industry 1.0 and the Natural (Disciplinary) Leader

Since early times, humans have employed tools and machinery to help them hunt, farm, travel, build shelter, and manufacture goods. These simple tools and machines were traditionally driven by muscle power. In the late eighteenth century, inventors such as Thomas Savery and James Watt discovered ways to power pumps, looms, and carriages with water and steam energy. This resulted in the centralisation of production in mills and factories governed by patriarchal owners using what Adam Smith terms as division of labour.[5] Erik Brynjolfsson, Andrew McAfee, and Jeff Cummings argue in *The Second Machine Age* that the Industrial Revolution 'ushered in humanity's first machine age—the first time our progress was driven primarily by technological innovation—and it was the most profound time of transformation our world has ever seen.'[6] Traditionally, small manufactured goods such as textiles were produced in cottage industries, affiliated to medieval guilds. The first industrial revolution allowed for the factory-based production of manufactured goods and mass transportation of these products via mechanised forms of transport.

There is a link between business context, organisational conditions, and leadership behaviour. The rapid rise of factories saw the birth of a centralised migratory workforce who moved to the urban towns from rural parts, leaving their family unit so as to live and work in the factories. These family-owned businesses were controversially modelled on plantation slavery with chiefly

Table 2.1 Age of steam (circa 1760s onwards)

Business context	Organisational conditions	Leadership behaviours
Mechanisation	Sweatshop	Disciplinarian
Family-owned	Division of labour	Exploitative
Patriarchal	Low waged	'Captains of industry'
Unregulated	Punishment monitored by overseers	Born leaders
Centralised factories	Worker exploitation including child labour	

unregulated patriarchal owners using men, women, and children in the mills and factories with little consideration for their condition and welfare.

What we saw in the last chapter relating to leadership 1.0 is that the prevalent attitude at the time was that leadership was an innate and natural quality. These industrial entrepreneurs who were 'new money,' often aligned themselves to the 'old money' aristocratic values by projecting themselves as natural born leaders. Thomas Carlyle referred to them as 'captains of industry' and appealed directly to them in *Past and Present* to overtake the nobility (or 'captains of idleness' as he referred to them) and become the new heroic leaders.[7]

This lack of regulation, sweatshop conditions, and employee exploitation by ruthless factory owners and their overseers is represented in Table 2.1.

Industry 2.0 and the Transactional (Directive) Leader

The second industrial revolution, pioneered in the New World, brought more technical advancement and science into the workplace as machines were powered by newly discovered oil and electricity. The new equipment, inventions, and the electrification of machinery required more technical know-how from the workers. This is the age of steel which led to a revolution in building design and the demand for steel-based products. It is the period of efficiency and assembly line production which was a military initiative and was shaped by a more scientific organisational approach. Companies became more structured/organised and increased output through standardised procedures.

As we saw in the last chapter, this was the era of classic conditioning. Theories of behaviourism led organisations to structure their premises and practices to enable leaders to condition the workforce. Ford's highly systemised and compartmentalised assembly line, used division of labour and conditioning stimuli such as bells, alarms, and whistles to control the workforce.

Conditioning also saw its way into administration offices (the modern equivalent of the medieval counting house) in the form of structure, hierarchy, and reward systems. This is neatly captured in Weber's bureaucracy and transactional management theories.[8] Standardisation, scienticism, and mass production became the norm in the workplace, largely inspired by Frederick Taylor's approach to scientific management where, as we saw in Chap. 1, he analysed workflows, documented working procedures, and produced a systematic approach to training and developing new hires.[9]

Training within industry started to occur in the late nineteenth century. The year 1872 saw the first documented factory training programme for machinists at Hoe and Company in New York; 1892 saw the first national training programme by NCR, which incorporated the factory model schools approach using classroom and transition-based learning via manuals and an instructor.[10] That said, there was no formal organisational leadership training during this period (formal leadership development didn't take off until several decades later). What we have seen from Chap. 1 is that Leadership 2.0 was a science-based approach working toward maximum efficiency and productivity in the workplace where management consultants such as Frederick Winslow Taylor, Morris Llewellyn Cooke, and Margaret Parker Follett advised leaders and organisations on structure, culture, and people management. Workers were viewed as 'hands' (to adopt Dickens' term employed in *Hard Times*) and were conditioned through compartmentalised structures, targets, and factory sirens.

Interdependencies between business context, organisation, and leadership continued in Industry 2.0. The post-war business environment was product-centric, where customer demand outstripped capacity. It was a regulated, formulaic, standardised, and compartmentalised assembly line where organisational structures were fixed and hierarchical. The leadership behaviour common to this kind of business and organisational setting is top-down, process-driven, directive behaviour. This is reflected in Table 2.2.

Table 2.2 Age of steel (circa 1850s onwards)

Business context	Organisational conditions	Leadership behaviours
Electrification Mass production Standardised operations Tight regulations Limited competition Unionism Product-centric	Assembly line/ compartmentalised Regulated Bureaucratic Hierarchical Predictive/fixed	Transactional Leader drives process and people Directive command/control Leadership is homogenous

Industry 3.0 and the Relational (Transformational) Leader

As technology progressed to include the use of computers, electronic office equipment, and simple robotics in the workplace, the third industrial revolution came into being, which revolutionised factories and offices. Erik Brynjolfsson, Andrew McAfee, and Jeff Cummings say in *The Second Machine Age*, 'Computers and other digital advances are doing for mental power—the ability to use our brains to understand and shape our environments—what the steam engine and its descendants did for muscle power.'[11]

The digital and technological revolution changed the face of established companies. The 1969 Apollo landings led America in the 1970s to believe that they were the leading country of innovation and technology, which resulted in a complacency and excessive self-confidence. Unbeknown to the US, Japan, a nation historically known for manufacturing cheap toys, imitation goods, and simple electronics, was leading a quiet post-war revolution, learning from American specialists, William Edwards Deming and Joseph Juran, about quality management (what became known as Total Quality Management or TQM). Japan focused on quality and began to imitate Western consumer items more efficiently and cost-effectively. As post-war markets deregulated, US customers started to benefit from the competitively priced digital watches, office supplies, household electronics, and cars that flooded the American market. US companies who had enjoyed leading market share were casual in their response to the new business reality and saw their market share plummet—successful corporates such as IBM, Xerox, Kodak Eastman, and others, who were directly impacted by Japanese competition, saw their profit and market share virtually collapse by the 1980s. Traditional US organisations urgently needed to transition from a product-led to a consumer-led organisation. This prompted an organisational restructuring away from highly engineered and conditioned cultures, and a profound change in leadership approach from transactional leadership to a more transformational approach.

These organisational changes, together with the rise in office and mobile technology, altered the dynamics between leader and employee, resulting in a more relational type of leadership. As we have seen, the current Industry 3.0 is the age of self-managing/empowered knowledge workers where speed and inventiveness became key and organisational structure changed from bureaucracy, hierarchy, and assembly line production towards more knowledgeable and flexible employees who could make self-empowered decisions about how they work in order to be more innovative for the benefit of the customer. In this context,

leadership became more relational—command/control leadership behaviours were deemed inappropriate and a more engaging leadership was called for. This period witnessed the emergence of industrial and organisational (I/O) psychology, a field that 'utilizes scientific methodology to better understand the behaviour of individuals in organizational settings',[12] and leaders were exposed to cognitive and psychological-based tools and instruments that promoted empathy with co-workers and motivated and influenced them using such techniques as emotional intelligence rather than directive behaviour. Major companies undertook 'transformational journeys' in the late 1980s and 1990s based on blueprints theorised by Robert K. Greenleaf, Max DePree, Peter Senge, Margaret Wheatley, Noel Tichy and Eli Cohen, and others.[13] Such transformation journeys focused on cultivating self-leadership, engaging with stakeholders, and increasing self-accountability. This new leadership model came under a variety of terms including stewardship, transformational leader, servant leader, creative leader, inventive leader, situational leader, roving leader, participative leader, and caring leader. Not all leaders successfully managed this transition towards relational leadership and remained locked in old attitudes of leadership as positional power.

The 1990s onwards has been a story of shifting attitudes to work. Office structures have become less presentist, bureaucratic and hierarchical and some companies have experimented in open space, hot-desking (a term borrowed from hot-bunking where submariners shared their bunks) and working from home. The culture of working in teams has steadily risen. The rigid suit and tie culture has eased up. The more recent emergence of the platform economy, also known as the gig economy, has led to an increase in freelancing, ecommerce, and the shared Uber economy—there are currently over 57 million American freelancers, which is 36% of the US population and this is set to rise to over 50% by 2027.[14]

Again, the link between leadership behaviours and organisation and business context can be drawn. The market environment is globalised, customer centric, and deregulated. The new organisational structure has shifted to a more flexible and dynamic approach with smaller organisations relying more on freelancers and cloud workers, leaner (diverted) portfolios, simpler structures, global reach, and a more team-based environment. Leadership behaviours are prioritised around setting direction, motivating and enabling others. Here leadership is less coercive and more people driven than process driven (although as we saw in Chap. 1, there is still a considerable amount of influence-led processing in Leadership 3.0). The mentality of leadership as commanding and controlling production that was fit for purpose in the age of centralised operations,

Table 2.3 Digital and information age (circa 1960s onwards)

Business environment	Organisational structure	Leadership behaviour
Mass customisation Advanced globalisation and competition Economic trading blocs Deregulation Ecommerce Shift from supplier to customer	Customer-centric Flexible/adaptive Borderlessness, dehierarchised and simpler structures leading to greater information flow Downsized/divestment More leaders (spread at all levels) Learning organisation Distributed leadership Freelancing	Relational Shared Empowering Enabling/ motivating Pro diversity Influencing Leader as coach Transformational

de-compartmentalised assembly line production, and hierarchical status-driven organisational structures, but it is wholly inappropriate in the digital and information age with its global competitive economy, knowledge-based workers, and fast-paced customer-driven environment. Table 2.3 highlights the connection between macroeconomics, the decentralised organisation, and relational leadership.

We can begin to see how each of these three systems evolved into a more integrated and connected economy with flatter organisations, empowered customers, emancipated knowledge workers, and a more relational leadership. Let's extrapolate this trend into the near future to what Klaus Schwab and others are calling the fourth industrial revolution.[15]

Industry 4.0 and the Responsive (Connected) Leader

We are going a little into the future because if there is any credibility to the idea that leadership is part of a symbiotic system which comes out of an economic and organisational context, then anticipating near future economic, social, and technical trends can lead us to an appreciation of the organisation of the future and the leadership required to inspire it. If we have this part of the puzzle worked out, then we can begin to anticipate how we develop future leadership, which is, after all, the preoccupation of this study.

I do not want to go down the path of sci-fi. Futurist commentators often get things spectacularly wrong with regard to human progress. *Back to the Future II* predicted 2015 to be a world of flying cars, self-drying

clothes, and hydrated pizzas and Ray Kurzweil in *The Age of Spiritual Machines* predicted that in 2009 we would all be wearing computers in jewellery.[16] I want to make some conservative technological and socioeconomic speculations about the next decade based on current realty, trends, and progress. These trends are paving the way for the fourth industrial revolution and will have profound implications for the way we live, work, lead, and develop leaders. So whilst anticipating the future can be great fun, I am not going to talk about flying cars, robot armies, or self-lacing shoes. I am going to restrict my observations to economic, social, and technological advances that are playing out now—as William Gibson said, 'The future is already here—it's just not very evenly distributed.'[17] Below are five current trends which are the seeds of Industry 4.0. These trends are already having an organisational impact. This is a story of connected consumers, amplified human capacity/intelligence, robotics/artificial intelligence (AI), digital decision-making through cloud and big data analytics, and machine learning. Overall, technology is set to become more indispensable—this is not just humans using technology to enhance the workplace (Industry 3.0); this is technology enhancing humans and replicating human function.[18]

Global Hyperconnectivity

On Sunday evening, April 9, 2017, a United Airlines passenger, 69-year-old David Dao, boarded flight 3411 from Chicago to Louisville. Passengers were asked to volunteer to give up their seats to accommodate United crew members who needed to connect with other flights. David Dao was randomly selected to give up his seat and was asked to disembark. He refused to cooperate, explaining that he was a medical professional and needed to be in surgery the next day. What happened next was recorded and broadcast across social media and taken up by international news outlets. Law enforcement officials were called and they physically yanked Dao from his seat and started to remove him forcefully from the plane. Dao hit his face on an armrest and cut his mouth. Bleeding, Dao was dragged by the wrists down the aisles screaming and protesting. He suffered a broken nose, concussion and lost two teeth.

As footage of the incident started to spread on social media, United Airlines defended their actions saying the passenger was being 'disruptive and belligerent'. United CEO, Oscar Munoz, issued a public statement where he 'emphatically' supported the actions of the crew. This response

caused growing international condemnation towards United Airlines, and the following day, Tuesday, April 11, United Continental Holdings stock fell by 4%, slashing $1 billion off the company's market value. The CEO immediately issued another statement acknowledging mistakes, offering his 'deepest apologies' and promising to 'fix what's broken so this never happens again.'[19] The stock recovered slightly but its market value was still down by $250 million. The story continued to dominate the news, more footage was released, the CEO continued to apologise and express sentiments of shame, compensation was offered to Dao and other passengers, lawsuits were prepared, and the CEO said a 'thorough review of policies that govern crew movement' was under way and vowed to 'put the customer at the center of everything we do.'[20]

Connected communities and prosumer groups who force company U-turns are all too common—it happened to Starbucks in 2007 when an internal memo that criticised streamlining was leaked, it happened in 2009 when United Airlines refused to compensate a passenger for breaking his guitar, prompting him to release a hit song that went viral, resulting in a 10% fall in United Airlines' stock which forced them to review their compensation and complaints handling procedures, it happened to Bank of America in 2011 when protests against their proposed ATM charges caused a reversal of policy. Of course, these incidents happened in pre-social media times, such as Royal Dutch Shell's decision to sink the redundant oil platform, Brent Spar, into the North Atlantic Ocean which led to a campaign headed by Greenpeace to boycott Shell petrol stations which forced Shell to reverse the decision and tow the platform to shore. The point is, the consumer is more connected and vocal in this social media age and is both consuming and producing media through online prosumer blogs. Incidents such as United Airlines' treatment of David Dao can quickly go viral and trigger policy change. Gray and Vander Wal express it rather well in *The Connected Economy*:

> The balance of power is shifting from companies to the networks that surround them. Connected, communicating customers and employees have more choices, and more amplified voices, than ever before. They have more knowledge than ever before. These trends are only increasing with time. This means the network—customers, partners, and employees—will increasingly set the agenda, determine the parameters, and make the decisions about how they interact with companies.[21]

Advanced connectivity is growing and will continue to trigger profound social changes in the future. Telemetry and the internet of things (IOT),

where networks and transmitting devices are embedded in physical objects such as cars and home appliances, is already a reality with a forecast of about 30 billion connected devices by 2020.[22] With the advancement of cloud technology, we will continue to find imaginative ways to connect in the future.

As of June 2017, there were a reported 3.8 billion global internet users with almost 50% of the world's internet users coming from Asia. Today, 40% of the world population is connected by internet. The next decade will see a tipping point for the internet, where over half of the world's population will be online.[23] An eMarketer retail study says e-commerce sales grew by 23.3% in 2017 to $22.737 trillion USD.[24] This statistical portal forecasts over 2.14 billion people worldwide are expected to buy goods and services online by 2021,[25] up from 1.66 billion global digital buyers in 2016. The connected consumer brings both opportunity and dangers. In his book, *Satisfied Customers Tell Three Friends, Angry Customers Tell 3000*, Pete Blackshaw describes the difference between the online consumer and the traditional consumer:

> Throughout the history of commerce, consumers have been at the mercy of business. Consumers have traditionally had little information, limited access to one another, and few outlets for feedback and communications. But the internet has changed all that. It's given consumers not only a collective voice but also a platform and a forum for those voices. Armed with a new suite of tools, resources, and technologies, consumers are no longer passive observers in the marketplace of ideas and commerce; they are actually defining and shaping the business landscape and the marketplace of tomorrow.[26]

This chimes with what Jeff Bezos, founder and CEO of Amazon, said in a *Fast Company* interview—'If you make customers unhappy on the Internet, they can each tell 6000 friends with one message to a newsgroup. If you make them really happy, they can tell 6000 people about that. You want every customer to become an evangelist for you.'[27] The business community needs to wake up to the fact that we are in the law of demand and not supply and that they need to better manage their online activity. Managing this toxic viralness requires leaders and decision-makers to look at their organisational structures and to initiate a strategy of collaborative networks and connectivism (a learning theory conceived by George Siemens that will be explored in later chapters in relation to leadership development). This will require leadership of the

future to be more connected, responsive, collaborative, and network-savvy to deal with the external influences on organisations.

Technological innovation is also driving the shared and platform economy. A recent *Financial Times* article points to a future of 'cloud working' where virtual workers bid online for tasks which, argues Denis Pennel, managing director of The World Employment Confederation (formally known as Ciett), is leading to 'people taking ownership again of the means of production.'[28]

The trend of the shared economy, developed in the late phase of Industry 3.0, where people share their cars (Uber), properties (Airbnb), and offices, is set to continue.[29] The platform economy is already generating tensions from traditional providers such as taxi companies and hoteliers. 2016 saw a steady rise of protests by traditional taxi drivers against the uberisation of the taxi business. As of 2017, Uber has faced being banned, blocked, or fined in well over ten countries,[30] including facing a ban by Transport for London. Airbnb is suffering a similar fate.[31] Trade unions are demanding better pay and conditions for contract workers and in 2016 New Zealand outlawed zero contract hours.

Hyperconnectivity is also influencing non state politics. The phenomenon started with the Arab Spring but continued in more subtle ways with Brexit and the election of Donald Trump as the 45th President of the US. This trend of anti-establishmentarism and a swing away from established power elites towards nationalism and insularity is set to continue into the next decade as more digital natives enter the voting demography and as traditional news coverage, which tends to be politically biased, is overtaken by social media and prosumer groups. In 2016, Pew Research pointed to 62% of Americans getting their news from social media,[32] a trend that will amplify in the coming years as digital natives shift from being consumers to 'prosumers' of news.[33]

Resistance to a globalised world order is growing. *The Economist* reports, 'As globalisation has become a slur, nationalism, and even authoritarianism, have flourished.'[34] This rejection of globalisation is evident in China which is 'increasingly turning inward for growth'[35] and in Donald Trump's America First policy and the burgeoning trade wars. The shift towards protectionism and tariffs will have a profound impact on global trade, and companies will need to make urgent strategic reassessments in this highly volatile environment.

Transhumanism and Intelligence Amplification

'Transhumanism' is about how we enhance human intellect and physiology through the use of technology. It is already happening, of course—the pacemaker, an implanted device that releases electric pulses and controls abnormal heart rhythms, has been a surgical procedure since 1958. Over the next decade, the consensus is that the use of pharmacogenomics, nanotechnology, and information technology to enhance our biological and cognitive performance will intensify.

Pharmacogenomics is revolutionising disease diagnosis and is progressing us towards 'personalised medicine' by identifying potential diseases at the DNA level. Nanobiotics, the development of molecular robots (or tiny walking robots), made a breakthrough in 2017. As was reported in *Science*,[36] Dr. Lulu Qian and her team from the California Institute of Technology created and tested a nanobot. 'Just like electromechanical robots are sent off to faraway places, like Mars,' says Dr. Qian, 'we would like to send molecular robots to minuscule places where humans can't go, such as the bloodstream.'[37] Next decade could see the everyday use of these nanobots to diagnose and repair microcircuits or even internal human blood, tissue, and organ disorders.

Transhumanism will also enhance our human cognitive abilities. Intelligence amplification (IA) has been part of our everyday lives since the digital and computer revolution last century. It is common nowadays to reach into our pockets for our smartphones to quickly Google information during conversations. The concept of cognitive enhancement and IA will become more sophisticated and common in the next decade building on current inventions. Technological 'wearables' which are tech devices that track fitness, stress, general health, and emotional awareness are set to become part of leadership wellbeing. Neurostimulation which is a developing technology that stimulates the brain to develop new skills[38] and opens future possibilities for instant skilling is actively being researched and will be a future reality. Research into Brain uploading to a computer is being sponsored by the Russian entrepreneur Dmitry Itskov, who founded the '2045 Initiative' which organised the Global Future 2045 International Congress at New York. Itskov and his vision for digital immortality was the subject of a 2016 BBC *Horizon* documentary[39] where a number of eminent neuroscientists support the idea of mapping the brain connectome and uploading it to a computer. Augmented reality (AR), where the physical world is 'augmented' by computer-generated environments, is also making tremendous progress. Virtual reality (VR), which has had a few high-profile false starts in the 1980s

and 1990s, is now very much a commercial reality with Sony, HTC, Facebook, Google, and Samsung all getting in on the game. The year 2016 was heralded as the 'year of VR'[40] and is beginning to have major applications beyond gaming and entertainment.

These transhuman technologies will undoubtedly influence our physical and mental development in the next decade and will have profound organisational and business implications. Pharmacogenomics and nanobiotics will allow us to anticipate and treat disease so that we live potentially longer and healthier lives which will mean more active adult consumers and an older generation talent pool, but it will also impact the healthcare sector which is a big global employer of people. Instant skills and virtual and augmented reality could revolutionise the way we train and develop people and propel the organisational learning culture away from costly and ineffective programmatic classroom training to personalised and self-directed learning. We will explore this further in Chap. 6 in relation to leadership and the use of technology to monitor and develop leadership skills through VR development and wearable tech devices. This technology will also have a direct impact on the banking and retail sector. As this *Financial Brand* news report says,[41] there is a prediction that augmented and VR will replace the traditional bank branch which could impact the estimated 500,000 US bank tellers.[42]

Robotics and AI

Industrial robots have been in use since the 1960s, but are now making their way out of the factories and into everyday life. They are less clunky with sophisticated sensors and more artificially intelligent and by the next decade will live alongside us in offices hotels and homes, giving us legal advice, delivering our pizzas, nursing us, as care-o-bots, beating us at board games, and conducting orchestras.[43] What this means is that it is not just the 'dirty, dangerous, and demeaning' low-skilled 3D jobs that will be impacted, but high-skilled jobs such as that of medical surgery, lab technicians, and teachers. The major difference between Industry 3.0 and Industry 4.0 is that in Industry 3.0 human intelligence programmed machines; in Industry 4.0, machines are set to become autonomous, unsupervised robobosses.[44] By 2030, it is widely believed that computers will match human intelligence.[45] This has prompted prominent scientists, AI researchers, and business leaders such as the late Stephen Hawkins, Elon Musk, and Bill Gates to sign an open

letter entitled 'Research Priorities for Robust and Beneficial Artificial Intelligence'[46] in which they called for more research to assess the potential pitfalls of a future world run by deep learning machines and AI.

A follow-up to the Deloitte 2017 *Global Human Capital Trends*, a *Forbes Magazine* article by Josh Bersin, founder and principal at Bersin by Deloitte, reports, 'Thirty-eight percent of companies in our new research (10,400 respondents from 140 countries) believe that robotics and automation will be "fully implemented" in their company within five years, and 48% of these companies say their projects are going "excellent or very well."'[47]

The media is full of apocalyptic stories about robots and artificial machines replacing jobs that don't require dexterity or empathy.[48] Classic studies from Deloitte and Oxford, Bank of America Merrill Lynch (BOAML), and Boston Consulting Group predict that 35–47% of jobs currently carried out by humans will be automated by the next decade. A Bank of England study[49] suggests up to 80,000 million US jobs will be displaced, and automation will threaten 77% of jobs in China and 69% of jobs in India according to a World Bank report.[50] OECD reports that 'AI matches or exceeds human performance in a growing number of domains'.[51]

The implications for organisations and leadership going into the next decade are profound. There is going to be a proliferation of artificially intelligent machines and robots in our offices, streets, and homes. Future leaders will need to navigate these hybrid resources. They will need to be able to make key decisions on human versus machine resourcing. The nature of jobs will certainly change with humans taking on more programming, data science, creative, and innovation tasks, in addition to the basic motor skills work that machines at the moment cannot do. Almost certainly, there will be job reductions as AI machines and robots take on more tasks.[52] This could lead to what Francis Collins, head of the Human Genome Project, and others predict to be a classic neo-Luddist rise in technological resentfulness where 'anti-technology movements will be active in the US and elsewhere by 2030.'[53]

This has sparked a discussion around universal basic income and the idea that people are given a basic amount of money to live without conditions. It is currently being trialled in Finland.

In this hybrid economy of networked humans and machines, leadership will move away from the leader as the source of knowledge and decisions in a human-centric organisation to a connected leader extracting information and learning from the intersection of ideas generated from networks of people and machines.

Data-ism

In his book *Information Anxiety 2*, Richard Saul Wurman, creator of the TED conferences, cites an interesting observation, 'A weekday edition of *The New York Times* contains more information than the average person was likely to come across in a lifetime in 17th-century England.' In 2010, Google CEO Eric Schmidt announced that the point had been reached where we were creating every two days more data and information in all human history than we had up until 2003.[54] Shapiro and Varian summarise these attributes by stating that in an age of computers and networks 'information is costly to produce but cheap to reproduce'.[55] Industry 3.0 saw a rapid rise in data and information. This is leading to a rise in digital sickness.[56] This decade has seen a rise in bots and learning algorithms to manage this data, including trading algorithms and even supervisory algorithms.[57] This trend will continue into the next decade and Industry 4.0.

This developing field has its own terminology. Data-ism is a recent term meaning to aggregate and mine huge data sets called 'big data'. Leading IT industry research group Gartner says, 'Big data is high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation.'[58] Analytics is the information resulting from data-ism which can be used to gain knowledge, improve or change business processes, and drive business success. Machine learning refers to unsupervised algorithms that arrive at conclusions through deep learning and automated analytics without human supervision. Cloud analytics allows for greater integration of the data sources.

This *Forbes Insights* study[59] shows that at least 90% of large global companies that were surveyed are investing medium to high levels in big data analytics. As Bernard Marr argues, companies that are investing in data-ism are among the most successful in the world:

> Increasingly, data is becoming a key business asset in its own right, and platform businesses that are entirely fuelled by data are among the most successful companies in the world. A glance at the 10 most valuable Fortune 500 companies proves this; in 2016, four of the top five most valuable companies have either built their entire business model on data, or are heavily investing in data: Apple, Alphabet (Google's parent company), Microsoft and Facebook are all in the top five. Amazon also joined the top 10 in 2016, jumping to ninth place from its previous ranking of 19.[60]

Marr concludes that every company should have a robust data strategy and 'every business should be a data business'.

The organisational benefits of gaining greater information on consumer habits and trends is offset with social issues concerning privacy. This information can be hacked and can be used in negative ways. As we progress towards more sensitive databases, security will need to be intensified using controversial voice and face recognition authentication biometrics. The idea of an increasing stored biometric database in the next decade of our faces, voices, and digital prints is a cause for concern for human and civil liberty groups.

Future leaders will need to know some basics about data science. This Kellogg School of Management white paper argues that future leaders will need to strike the right balance between leading and shaping the data versus allowing learning machines to manipulate and extrapolate the data.[61] This *HBR* interview[62] with MIT research fellow Michael Schrage counsels employing more data scientists and making them central/key collaborative partners in the organisation rather than technical 'geeks'. This is something we will explore in Chap. 7.

Alternative Sources of Energy and Power to Transport People and Goods

There is an effort underway to discover alternative sources of energy. The future is likely to consist of more localised and carbon-diminished energy production. Biotechnology, or technology that uses living organisms to generate products, medicines, and consumables, is advancing at a rapid pace. Sang Yup Lee, Professor of Korea Advanced Institute of Science and Technology (KAIST), paints a biotechnological future where we generate everyday household products, food supplies, organs for transplanting, and even renewable fuels. Dr. Lee predicts that biotech trash converters that convert waste to common household chemicals will be a standard home appliance within ten years.[63] This shift from consumer to prosumer will start to impact business in the future—if you group this with the developing technologies of solar energy and 3D printers, manufacturing will take a hit in the future as we shift towards self-sufficient and self-producing energy and products.

The major implication for alternative energy, however, will be seen in transportation. In *The Shift: The Future of Work Is Already Here*, Linda Gratton paints a dystopian scenario where future long-distance travel will be more costly as fossil fuels decline, resulting in less travel and imported goods becoming more expensive. I disagree with this view. The IMG Fiscal Monitoring Report's prophesy[64] of a shift from a high- to low-carbon economy will, in my

view, materialise and transportation will become cheaper, cleaner, faster, and more accessible. We are already seeing alternative forms of energy being tested for transport purposes. In 2016, a solar-powered plane circumnavigated the planet.[65] Elon Musk is working on Hyperloop One using vacuum tubes and electromagnetic levitation. Virgin's Richard Branson joined the project in 2017 and aims to have a hybrid conventional and Hyperloop transport system in place by 2021.[66] The Hyperloop is said to have the per-person energy usage similar to a pushbike.[67] The year 2017 also saw a drone taxi service, the Volocopter, tested in Dubai.[68] The German firm that produces Volocopters is anticipating they will be operational by the early 2020s with a two-seater taxi that can be ordered via an app. And, of course, electric cars have been steadily progressing in the background and are becoming faster and more efficient with charging stations increasing year on year.

This transportation revolution will have dramatic implications for the way we shift goods and people particularly as this developing technology is digitalised and accessible via apps. With less reliance on fossil fuels, there will also be ramifications for oil and gas producing nations. Moreover, if the logistics of transporting people and goods is reduced, the logistics and retail sectors will be impacted. Faster transportation systems will revolutionise the dispatchment of goods and food supplies, which may facilitate a greater percentage of online purchasing, shunted through Hyperloops and delivered to our doors by programmed robotic devices or drones. This is leading to an inevitable demise in bricks and mortar premises and a reduction in retail jobs. The high street of the next decade will be more of an 'experience' with cafes and entertainment centres rather than an place to shop or bank. This *Business Insider* article[69] predicts a remodelling of the traditional high street and a creative use of high street environments.

In this section, we have predicted a future context of hyperconnectivity, a consumer sharing and producing economy, advances in robotics, AI, and new forms of alternative non-carbon energy. The fourth industrial revolution is being driven by new technologies that integrate the digital, biological, and physical worlds and is already having a profound impact on socioeconomic life. Thomas Power argues, technology is not a machine, it's a species.[70] Based on the formula of the symbiotic relationship between business context, organisational scenarios, and leadership behaviours that we have identified from previous industrial revolutions, we can begin to hypothesise the future direction of organisations and leadership. These scenarios will serve us well when thinking about future leadership development (the subject of this book). These ideas will be developed throughout the book but in essence, Industry 4.0 will create a volatile, uncertain, complex, and ambigu-

ous world (the military term for this is VUCA) resulting from the emerging technology, hyperconnectivity, and shared/platform consumer producing 'cloud' economy. Organisations will need to urgently respond to this by evolving into a more connected and collaborative organisational design which functions through collaborative networks of internal and external biotic and abiotic agents that continuously co-create and revise the organisations' strategy and direction through collaborative networks. The future will see a demise in the structure of the organisation[71] as we know it and an increase in collaborative, algorithmic strategy and digital decision-making to respond to the fast-paced changes that will be the hallmark of Industry 4.0. Leadership, of course, will also need to adapt, away from organisational leaders as decision-makers and people influencers (with tenacious legacies such as transactional management, graduate recruitment/estimated potential programmes, stone-clad talent pipelines and transmission-based learning that has been around since the 1900s leading to incongruous superhero and command/control leadership behaviours) to leaders as connectors and navigators who can flourish in a connected, integrated, intersectional, and collaborative environment. Industrial Revolution 4.0 will be the first time we have a true hybrid of biological and non-biological systems. Here systems are more complex and leaders need to think and act more cybernetically. Covey defined leadership as the person who climbs the tallest tree and shouts 'wrong jungle'.[72] The future leader, with the support of data mining technology, will need to be more responsive—to sense the patterns and signals that are trafficking through the network like primitive drumming and choreograph a collaborated direction from multiple agents in a constant field of growth, change, and opportunity. The future leader will need to cultivate connected organisations and networks and understand the science of connectivity and organisational networked learning. This will require a leadership shift from the leader as the source of knowledge and decisions to a connected leader who creates the right environment for collaborative networks to thrive and for ideas, decision, and direction to come from the swarming communities of consumers, partners, analysts, algorithms, and paid resources and not directly from the leader. The effective leader of tomorrow will be a collaborative and responsive individual that shapes the environment and commercialises the intersectional ideas generated from the networked community.

This scenario of a future VUCA business environment, a connected organisation, and the rise of the connectivist/responsive leader is represented in Table 2.4.

Table 2.4 AI and the robotic age (present onwards)

Business environment	Organisational structure	Leadership behaviour
Robotics and machine intelligence Consumer production Hyperconnectivity and networked consumers Talentism not capitalism Automation of both 3D tasks and specialist jobs New biotechnologies Data-ism Alternative sources of energy to power machinery and transport people and goods	Networked Wirearchical and collaborative structure Protean Co-resourcing of humans and machines Smart working environment and decline of bricks and mortar office spaces Community of internal/external biotic and abiotic agents Rise in status of programmers and data scientists	Swarm Connectivist Responsive, adaptive, and collaborative Reliance on humans and machines to generate decisions Embracing diversity Systems and cybernetic focused Generative—cultivating a learning network Self-organising Emergent

Table 2.5 The four industrial revolutions and business

Industrial revolution 1.0 Mechanisation	Organisational structure 1.0 Centralised workforce with division of labour	Leadership 1.0 Natural
Industrial revolution 2.0 Electrification	Organisational structure 2.0 Structuralist, bureaucratic, and divided organisation[a]	Leadership 2.0 Transactional
Industrial revolution 3.0 Computerisation	Organisational structure 3.0 Decentralisation	Leadership 3.0 Relational
Industrial revolution 4.0 Machine intelligence	Organisational structure 4.0 Wirearchical and networked organisation	Leadership 4.0 Responsive

[a]David Gray and Vander Wal's term. Gray, David, and Thomas Vander Wal, *The Connected Company* (California: OReilly Media, 2012)

The Four Systems and a Theory of Cybernetics

What we have seen in the previous section are four systems all of which are increasing in connectivity and complexity (Table 2.5):

The case for an increasing connectivity within economies and organisations and the tie to a more responsive leadership can be linked to management cybernetics. One of the best descriptions on management cybernetics comes from Stafford Beer. In his lectures, some of which are available online, Beer explains the principle of management cybernetics using Watt's Centrifugal 'flyball' Governor.[73] In Watt's Governor, you have a powered shaft that is whizzing around and driving the mechanism. If the engine gains excessive

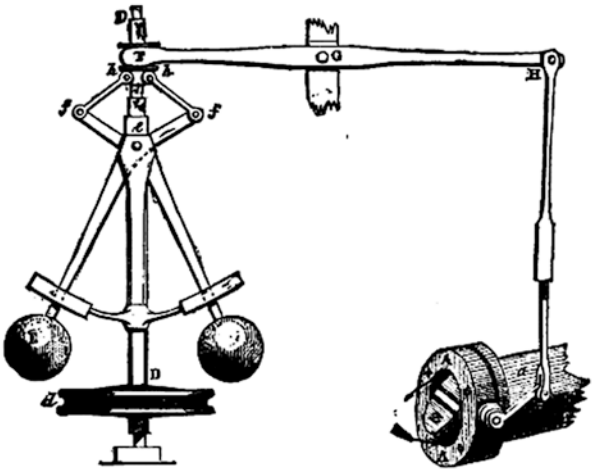


Fig. 2.1 Watt's Centrifugal Governor (AD 1788). (Routledge, Robert, *Discoveries and Inventions of the Nineteenth Century*, (Project Gutenberg, 2017). Accessed June 2018. http://www.gutenberg.org/files/54475/54475-h/54475-h.htm)

speed, centrifugal forces drive two weights out that pull a steam valve up to shut off the steam supply (Fig. 2.1).

Stafford Beer considers this to be one of the earliest cybernetic inventions because a runaway variable is brought under control by the inner system—it is brought back into control 'in the very process of it going out of control'.[74] In this sense, it is has intrinsic regulation. Beer considers this to be a vital management principle. According to Beer, an effective management system is one which has an intrinsic self-regulatory inbuilt system; in other words, it should not be controlled by leaders, managers, or supervisors, but should be autonomously self-managed through inbuilt feedback and self-observing systems.

Cybernetics is a widely misunderstood discipline. The prefix 'cyber' is commonly associated with network systems which would suggest cybernetics has something to do with the science of computers and networks. This definition is implicit in Norbert Wiener's conceptualisation of cybernetics from the title of his 1948 publication *Cybernetics: Or Control and Communication in the Animal and the Machine*, where the modern term 'cybernetics' made its first appearance.

In fact, the root of cybernetics is from the Greek *kubernētēs meaning* 'steersman', from *kubernan* 'to steer'. Kubernētēs, mentioned in Homer, was the steersman who operated the long rudder at the back of Hellenic ships such as

the trireme. The Latin word is gubenator and the French word is gouverneur *with cybernétique* meaning 'the art of governing'. English has, of course, 'governor'. So cybernetics means to steer with connotations of governor.[75]

Cybernetics is a transdisciplinary approach for studying self-regulatory systems. The list of original contributors is international and multidisciplined[76] and has been categorised by Heinz von Foerster, a Viennese cybernetician, into two orders of cybernetics to help clearly distinguish between the actual mechanism and the observer. First order cybernetics is concerned with observed systems or mechanisms (it is based more on circular causality and feedback and resides principally in engineered systems, mechanics, computers, and AI and is not associated with cognition). Second order cybernetics is concerned with the constructor, controller, and observer of the systems (which is intrinsically more about cognition and biological systems/living organisms).[77]

These four ecosystems demonstrate an intrinsic complexity that has come about through intense socioeconomic and organisational change. Leadership has evolved with these changes, from patriarchal and transaction models of leadership towards self-regulation and responsive leadership behaviours. The patriarchal system in Industry 1.0 was governed by factory owners. The scientific management approach of Industry 2.0, had assembly line systems steeped in bureaucracy and directiveness; that said, procedures were documented, which was a small step towards self-regulation. Industry 3.0 and the knowledge economy is the first true management cybernetic system, generated by computer programmes. It is self-regulating and employees are encouraged to give feedback to the relational leader. The future AI system in Industry 4.0 transports us into the realm of advanced first and second order management cybernetics. Biotic systems will hybridise with abiotic and AI systems. It will be a self-regulating and hyperconnected ecosystem with feedback loops coming from multiple sources. Leaders will need to be connectors in this system and an innovative approach to developing leaders will be required.

In this chapter we have been exploring how changes in energy, technology, and society have prompted a steady shift towards Industry 4.0 and hyperconnectedness (connected and global economies, connected and vocal consumers, connected and wirearchical companies, and connected and responsive leadership). Reports suggest that Industry 4.0 will be with us as early as 2020; some argue it is already upon us, creating a volatile, uncertain, complex, and ambiguous world. The question every organisational decision-maker should be asking themselves is how their organisation can develop responsive leaders to navigate this complexity. This book seeks to answer this question, gaining inspiration from the natural world.

Notes

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18. cf. Some argue that there is no such thing as Industry 4.0 but that it is a continuation of Industry 3.0.
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3

Introducing a Systems and Vertical Approach to Developing Leaders

Let me tell you a story about Caroline.[1]

> Caroline is a 38-year-old retailer from the UK who was promoted from *Global Brand Manager* to a Senior Leadership position. I was asked to give her some leadership coaching as she was struggling to transition from manager to leader. This is her journey. Caroline attended a top-flight university, studying mathematics and statistics. She graduated in the top 5 percent of her year and had three employment offers. She selected a traditional retail company because it was an international organisation, offered a competitive starting salary, and had an established graduate development programme. Caroline went through a formal assessment centre where, among other things, she was assessed for leadership potential. She did well in the assessment and was categorised as a 'high potential' leader ('HiPo'). The 24 month graduate programme included a general introduction to the retail industry, some technical programmes and two 9 month placements. It also included a one week residential Graduate Leadership Programme that included some core foundations in personal mastery, business acumen, and influencing others. What she remembered about the course was that she drank a lot, was introduced to many theoretical tools and models flashed up on PowerPoint slides, and played games with ropes, bricks and blindfolds.
>
> She didn't feel particularly stretched during her two year graduate programme or felt that she was contributing much to the organisation. She was frequently told by her managers to 'take it easy' and enjoy her two years of 'freedom' as she had plenty of time later to get stressed out in her 'real job'. At 24, the graduate programme came to an end and Caroline was working in the marketing department as a *Brand Analyst*. She was an individual contributor with no direct reports. She impressed her bosses with her commitment and hard work. At 27,

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R. Kelly, *Constructing Leadership 4.0*, https://doi.org/10.1007/978-3-319-98062-1_3

she was given her first supervisor role with three direct reports. It had been five years since she had attended the graduate leadership programme and she struggled to lead her team. She enjoyed the status of being a manager, but she never used any of the tools that she had learnt on the graduate programme. She built a reputation among her team as an ambitious taskmaster who became easily frustrated when her team failed to keep up with her. Typically, she would complete tasks herself rather than trust or coach team members. These early dissonant behaviours were noted by her managers, especially after receiving complaints from her team members, but it was felt that these problems would iron themselves out once she gained more managerial experience. By the age of 31, she had already had two promotions under her belt, had completed a company-sponsored MBA programme, and had been on a number of internal and external technical and communication skills programmes. She was nominated to attend a mid-career leadership programme which was viewed by the organisation as a key milestone toward senior leadership. The five-day programme blended classroom training with work-based learning assignments, and some individual leadership coaching. The programme reintroduced many of the tools, models and approaches that Caroline had encountered on her graduate programme, including personal mastery, personality styles, some classic influencing and engagement skills, and some core business skills relating to change management and planning. Caroline knew she had problems managing others and was looking for some inspiring ideas. The programme did not meet her expectations and she disparaged it, telling her colleagues that she 'already knew this stuff'. On the last day she sat in a group circle and shared with others her key learnings and the things she would do differently in the workplace. Back at the office, she quickly reverted to her usual routines. The workplace assignment, which she had agreed to complete, was forgotten and she rescheduled her coaching sessions so many times that in the end they came to nothing. For the next few years, Caroline did rotating assignments—including an overseas assignment—and was promoted every 18–24 months in managerial roles with increasing management responsibilities and seniority. She still had a strong tendency to micromanage and this led to a high turnover in her team. That said, she was seen as a safe pair of hands who got things done. She attended a senior leadership programme at the age of 35 which focused on authenticity, decision-making and more personal mastery (the 'touchy feely stuff' as she referred to it). The programme was facilitated by a-list leadership consultants and authors and was a blend of classroom teaching, costly business simulations, peer coaching, and post-course assignments. She felt challenged and spent the week competing with her intellectual equals. At 36 she was offered her first executive leadership role (15 years after joining the company). Several months into the assignment, and it was clear that things were not going well for her—she failed to transition from manager to leader and was too directive with her experienced leadership

team. Her sponsors recommended that she did some executive coaching. When I first met her she was resentful, stressed and generally exhausted. She viewed me as a spy because I had conducted a 360-degree feedback exercise where a selection of stakeholders had given anonymous feedback. I also spent half a day interviewing her leadership team. All the feedback pointed to someone who was a perfectionist, task-oriented, micromanaging, controlling, lacking in trust and, at times, came across as pedantic, aggressive and bullying. All classic directive behaviours. When we sat together and processed the feedback, the young executive wasn't in the least surprised by the report, but she expressed irritation that people had been allowed to speak so freely—at times she would point to written feedback and say 'I can guess who said that.' It felt like she was already plotting her revenge. I asked her a leading question: whether she thought these types of behaviours contributed to being an effective leader. She looked me in the eye, arched her eyebrow and said, somewhat indignantly, 'I don't think my leadership is in question here.' It was clear that Caroline's understanding of leadership was rooted in Leadership 2.0. Commanding, controlling and processing workloads were, for her, indicative of a strong leader. This story doesn't end well. Several weeks into the coaching sessions, I received an email from her saying she had resigned and found a new role in a more 'dynamic company' that better suited her talents. Her sponsors were sorry to see such a promising executive leave and were left puzzled how this high performing manager had failed to make an impact as a leader—'we backed the wrong horse there,' was the mumbled consensus.

Sound familiar? This approach of processing leaders has been in place since the last century and it is still the standard way of developing leaders in most medium to large organisations today.

Ricardo Morse and Terry Buss specify four broad approaches to leadership development: self-study, leaders growing leaders, organisations growing leaders, and formal leadership training and education.[2] Most companies today still believe in programmatic leadership development—where preselected high-potential leaders are shoved in strategic talent pipelines, pyramids, and frameworks, and formally developed in classroom and work-placed learning programmes. It is a cynical sheep dip where these HiPo processed leaders unfalteringly follow the organisations' driven formula to get them into leadership seats. Warren Bennis calls this approach 'driven' leadership and Ronald Heifetz and Marty Linksky term it 'scripted' leadership.[3] Typically, processed leaders find their first leadership assignment a stretch and a 'make or break' experience.

There are a number of difficulties with processing/programming leaders that is becoming increasingly apparent as we advance into more volatile times.

It Is Biased Towards Cognitively Developing Leaders

As we saw in the introductory chapter, the cognitive approach to developing leaders became influential with publications by Chris Argyris, Donald H. Schön, Peter Senge, and others.[4] This personal effectiveness approach led to a generation of programmes where leaders were encouraged to explore their own vision, values, defining moments, mental models, assumptions, inner dialogue, and were invited to cognitively reframe these assumptions and mindsets in order to engage and inspire others. For Peter Senge transformational cognitivism was central to his learning organisation project as a way to create organisational change through emergence. In his seminal 1990 book, *The Fifth Discipline*, which precedes the internet age, Senge proclaimed that organisational learning could be predominately built through individual cognitive effort where reconstructed leaders, with the right tools and instruments, influence the system in a positive way. Established psychometrics such as leadership styles, Myers-Briggs Type Indicator, and Johari window were eagerly adopted as leadership self-awareness instruments,[5] and left hand column, ladder of inference, and advocacy and inquiry became standard leadership tools taught on executive training programmes throughout the late eighties, nineties, and into the millennium.[6] Cognitive reframing also sparked leadership self-help publications such as Covey's, *The 7 Habits of Highly Effective People*.[7]

Clearly, the notion of a more thinking, reflective, and empathetic leader came at the right moment in organisational history where directive behaviour was no longer deemed appropriate for knowledge-based workers who oftentimes knew more about the area of the business than their leaders and who needed to be better empowered to connect with their stakeholders. Educating leaders using these cognitive reframing methods clearly helped to create a more confident and self-reliant workforce. There are, however, challenges with the cognitive approach.

- The assumptions behind the cognitive approach is that the leader needs to be more cerebral which has led to an entire generation of leaders being recruited direct from university (a clear departure of earlier models of the self-made 'captains of industry').
- Organisations shaped their leadership development around competency models.[8] This has led to a generation of cognitively dependent leaders whose leadership is expressed through frameworks, psychometrics,

pyramids, self-assessed competences, and cognitive skills. Oftentimes, new leaders are woefully ill-prepared to cross the threshold of leadership because they cannot function outside of their boxed matrices, competency frameworks, and cerebral models. Cognitive dependency does not prepare leaders to lead in a VUCA world.

- Leaders have been cognitively developed as individual change agents within the organisation for the past four decades, and it is questionable to what extent this individual cognitive reframing approach has been effective. The 39 hours and $4000 dollars spent on HiPo leaders each year to attend these facilitated residential group events does not appear to be money well spent according to the research outlined in Chap. 1.[9] Moreover, the approach of recruiting cognitively reframed leaders as change agents for the organisation has proved to be a slow path to leadership transformation because 'dysfunctional hierarchies', as Senge himself calls them, can hamper the flow of learning across the organisation.[10]
- Developing leaders in cognitive behavioural labs can lead to what Deborah Rowland calls the 'parallel universe syndrome' where programmed leaders enter back into the system and quickly revert to old habits.[11]
- Lastly, the idea of the learning organisation was conceived before the internet age and has been superseded by theories of connectivism and networked learning. Quite simply, cognitive development of leaders has past its sell-by date.

It Encourages the Idea of Succession Rite

Processed leaders are by definition leaders that are identified, nurtured, and promoted by an organisation that moves its young protégés around like chess pieces. As long as they don't screw up too badly, they naturally rise to the top as a fait accompli. Succession rite still exists within large organisations today. John Kotter, famed for his work on change management, comes close to describing the succession rite mentality:

> Most of the successful white-collar workers in the past hundred years found reputable companies to work for early in their lives and then moved up narrow functional hierarchies while learning the art of management […] to progress beyond a certain level one had to learn about management, but not much about leadership.[12]

Even though careers are no longer rigidly managed by HR professionals as they were in former times, there is still a sense of process and succession, with

internally promoted leaders coming almost exclusively from the elite cache of high-performing managers that were recruited from the top universities and groomed for the top jobs. Ambitious employees who try to bypass this succession rite are often derided in the corporate world as upstarts and self-promoters. Companies still rely on recruitment and retention processes dating back to the last century and many evaluate leadership potential using assessment methods employed 100 years ago by the US military. The major problem with this succession rite approach is that some talented outliers can be overlooked for leadership roles because they have not been processed by the system. Even worse, leaders can be appointed because of their high-potential status when, in fact, they are not ready or suitable for the role. Moreover, succession rite leads to a rigid formula of development where people are developed as part of a programme rather than meeting a personal need—such as Caroline's experience of doing a graduate leadership programme that had no relevance to her day job.

Management Assignments Are Used to Groom Leaders

Most organisations go to great lengths to recruit leaders and then put them to work as managers. For large organisations, progression into leadership is almost exclusively dependent on high-potential emerging leaders passing through appraised management hoops and gateways, and yet many seminal commentators and thinkers on leadership (including Abraham Zaleznik, C.M. Watson, Warren Bennis and Burt Nanus, John Kotter, Stephen Covey, Elwood Chapman, Bernard Bass, G. Capowski, S.C. Certo, and P. Northouse) differentiate between leadership and management.[13] 'I can't tell you how many times I've heard people use the words "leadership" and "management" synonymously', argues John Kotter, 'and it drives me crazy every time.'[14] Warren Bennis usefully differentiates between management and leadership in his classic 1989 text, *On Becoming a Leader:*

- The manager administers; the leader innovates.
- The manager is a copy; the leader is an original.
- The manager maintains; the leader develops.
- The manager focuses on systems and structure; the leader focuses on people.
- The manager relies on control; the leader inspires trust.
- The manager has a short-range view; the leader has a long-range perspective.
- The manager asks how and when; the leader asks what and why.

- The manager has his or her eye always on the bottom line; the leader's eye is on the horizon.
- The manager imitates; the leader originates.
- The manager accepts the status quo; the leader challenges it.
- The manager is the classic good soldier; the leader is his or her own person.
- The manager does things right; the leader does the right thing.[15]

Given the level of agreement that leadership commentators have on the difference between leadership and management and the consensus, dating back 50 years, that leadership is a unique activity with specific tasks, skills and behaviours that are different from management, it is perplexing that organisations still develop their leaders through the management route.

It Leads to a Fixation on Measuring Leaders

William Thomson once said in a lecture, 'When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind.'[16] Most leaders are still developed and trained quantitatively through competency based education and training (CBET) that has its roots in behaviourism and scientific management.[17] Medium to large companies have a compulsion to measure every aspect of developing leaders. Oftentimes, LD departments are busy number-crunching PowerPoint presentations for senior executives that depict leadership development effectiveness in terms of volumes, diversity, costs, and participant satisfaction rates to justify the large spend associated with developing leaders.[18] Much of the approach to measuring corporate training stems from the research by Donald Kirkpatrick.[19] The problem with a purely quantitative-based approach is that organisations can get too fixated on the statistics and miss the bigger picture as to whether the approach is actually producing effective leaders.

The Primary Method of Developing Leaders Is Still Via Discredited Formal Classroom Training

Studies such as the 2017 Brandon Hall Group *Training Benchmark Study* and a 2016 *Training Industry Report* show that classroom-based training is still a preferred method for learning and developing leaders within medium to

large organisations,[20] despite well-researched studies exposing their ineffectiveness.[21] The problem with classroom and transmission-based learning is that it is a cerebral and cognitive pedagogy that is removed from everyday leadership experience and environments.[22] Leaders attend residential programmes where they learn in a detached setting about their values, preferences, emotional triggers, and how to relate and engage with others. Like Caroline, they return back to the daily challenges of the workplace and the learning is quickly forgotten.

Transmission-based learning has been with us since antiquity. Ancient China used transmission-based learning at every level of its education system.[23] Transmission-based learning continued through Greek, Roman, and early Christendom cultures. Gail Edwards opines that the transmission of knowledge between humans in educational settings occurred in the seventeenth century with the growing secular acceptance that the origins of knowledge doesn't necessarily originate from God or his representatives but can be self-constituting.[24] The modern classroom method was based on the Prussian primary education system that was laid out by Frederick the Great and his 1763 Generallandschulreglement decree authored by Johann Julius Hecker, which paved the way for secularised curriculum-based instructional learning. This model became the blueprint for modern schools with their rows of desks, curriculums, tests, and structured break times signified by bells and whistles. It led to the establishment of factory model schools across Europe and North America which, in turn, influenced organisational training. The factory model followed a direct instruction pedagogy where teachers lecture at the front of the classroom to students who are sitting behind rows of desks and tables—giving rise to the expression, the 'sage on the stage'. The educationalist Paulo Freire in his famous work *Pedagogy of Oppressed* calls this the 'banking concept' of education:

> Education thus becomes an act of depositing, in which the students are the depositories and the teacher is the depositor … In the banking concept of education, knowledge is a gift bestowed by those who consider themselves knowledgeable upon those whom they consider to know nothing. Projecting an absolute ignorance onto others, a characteristic of the ideology of oppression, negates education and knowledge as processes of inquiry. The teacher presents himself to his students as their necessary opposite; by considering their ignorance absolute, he justifies his own existence. The students, alienated like the slave in the Hegelian dialectic, accept their ignorance as justifying the teacher's existence—but unlike the slave, they never discover that they educate the teacher.[25]

Anyone who has sat through a 'death by PowerPoint' presentation, will know what it is like to have such a brain dump.

Transmission-based learning supposes there is a formula (a 'right way') to develop people and that leadership development is something that is 'done to somebody'. Social constructivism sought to move away from classroom and theory-based approaches to developing leaders by blending traditional forms of transmission-based learning with 'living laboratories'[26] and social learning such as work-based learning, job shadowing, supervised leadership assignments, and business simulations that replicate the everyday work context. It also sought to radicalise the formal classroom approach with transactional learning methods which shifted the learning from passive to active, where the teacher switches from instructor to constructor and helps the learner to build knowledge. This is a shift away from teacher to learner-centred education, where the instructor helps the learner to make sense of the material—what Vygotsky and Bruner term a 'scaffold' to the learning process.[27] Social and transactional learning are discovery-based pedagogies that better connect with the learner, but this approach is still programmatic and centrally organised. This blend of classroom approach with social learning often fails because learners typically do not follow up or give dedicated time to work-based assignments.

It Reinforces Horizontal Development and a Culture of Dependency

The type of banking and formulaic education explored above is horizontal in nature and induces a culture of dependency. Horizontal development is a term employed by Susan Cook-Greuter and Nick Petrie to signify lateral growth.[28] The classic approach to leadership development is to preselect leaders, strategically place them in talent pipelines, undertake a business leadership needs assessment in order to understand business requirements, produce a list of leadership competencies, create a personal leadership development plan anchored in management, and design learning interventions using off-the-peg tools in classrooms or workplace learning environments. The problem with this approach is that it encourages lateral growth through replication, habitual transmission, and reinforced structures. Nick Petrie from the *Center of Creative Leadership* says, 'Horizontal Development refers to the adding of more knowledge, skills, and competencies. It is about what you know, which we can measure through 360-degree feedback.'[29] Petrie likens horizontal development to a glass container where the organisation sets the parameters, and the leader's

development and capability is defined, programmed, measured, shaped, and steered by the organisation through pipelines, pyramids, and management gateways where knowledge, skills, and competencies are pumped into the passive leader. Success and succession for the leader comes through compliance to this process. The problem with this approach is that it leaves leaders ill-prepared for the challenge of leadership and, like Caroline, they can struggle to transition from manager to leader. It produces scripted and dependent leaders who are knowledgeable about theories of management and leadership, but struggle to transfer this knowledge into meaningful behaviours that will thrive in a VUCA environment.

We need to break away from prescriptive, lateral, and (mainly classroom) instructed horizontal environments to a more dynamic and vertical leadership development where leaders are responsive, adaptive, and connected to the innovation and decision-making that flows and swarms across collaborative networks. This point will be developed shortly.

It Reinforces Positional Power

By focusing on charisma and leaders as people influencers and decision-makers, we are simply reinforcing the idea of leaders as charismatic superheroes who maintain positional power. Followers collude in this. The conditioning structures where the leader occupies the top of the hierarchy and has a key part to play in their teams' recruitment, promotion, appraisal, development, job allocation, and general organisational well-being can promote sycophancy among followers that serves to reinforce positional power. It is hard for a cognitively reframed leader who is on a 'transformational journey' to resist a system that reinforces status and submissiveness through its very structure (the topic of the next chapter).

How Can We Do Things Differently?

Two things must be done if we are to kick the tenacious legacy of processing charismatic leaders and start developing independent, collaborative, connected, responsive, and agile leaders capable of enduring the VUCA climate of Industry 4.0. We need to expand beyond cognitivism and develop leaders in a broader system that includes the environment in which leaders lead (the leadership ecosystem) and abandons the horizontal processing of leaders.

Leadership as a System

We need to adopt a holistic approach to developing leaders which takes into account not only the individual leader's mindset but the structures and networks that influence and shape them. This approach is a systems-led, not a process-led, way of developing leaders. Donella H. Meadows defines a system as 'an interconnected set of elements that is coherently organized in a way that achieves something. If you look at that definition closely for a minute, you can see that a system must consist of three kinds of things: elements, interconnections, and a function or purpose.'[30] In the previous section, we introduced the idea of the parallel universe syndrome where leaders return back to the workplace after a residential leadership programme only to have their learning challenged by a culture and network that reinforces their status and positional power. Taking leaders out of the classroom environment and developing them in the workplace (the social learning approach) has proved an awkward fix. We need to take a more systems-based approach to developing our leaders which focuses not only on the individual mindset but on structure and connections. This approach is represented by the Venn diagram in Fig. 3.1.

What this diagram signifies is that it is not enough to cognitively develop leaders in isolation through forced mindset reprogramming. We are asking too much of our leaders to carry the transformational change effort on their shoulders. In this Venn diagram, leadership behaviour is influenced by three

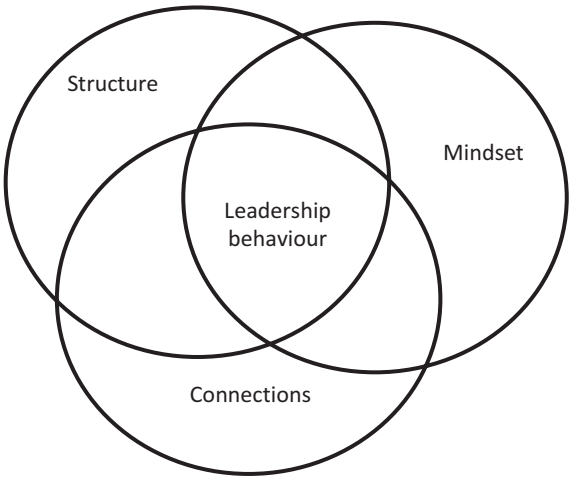


Fig. 3.1 Venn diagram representing a whole systems approach to develop leaders

systems: structure, mindset, and connections. These systems are linked to the four core twentieth-century learning pillars of behaviourism, cognitivism, constructivism, and connectivism outlined in the introductory chapter.

In this single Venn diagram, I believe we can see at a glance everything that is wrong with leadership development today. Contemporary leadership development is profoundly disconnected. During the transformational leadership experiments of the 1980s and 1990s, there was a considerable degree of restructuring or organisational hierarchies and environments, but divisions between leaders and followers persisted in the everyday culture and operant conditioning) and continues to persist today. It is said that structure influences behaviour.[31] It has been counterproductive—almost pointless—to teach leaders transformational leadership behaviours when they are in a system that expects them to carry out basic transactional duties such as appraising their staff. The ecosystem is not reinforcing the leadership aspiration and produces bipartite leaders.

We need to have a more integrated and holistic approach to developing leaders which expands beyond mere mindset training. The three leadership development systems of structure, mindset, and connection and the pillars of learning reinforce leadership behaviours of responsiveness, readiness, and adaptiveness needed for industry 4.0.

We have to be honest: in Industry 3.0, the pillars of learning contradicted the objectives of transformational leadership left, right, and centre and were driven by outdated and disjointed legacies. Reward structures reinforced positional power; fixed hierarchies reinforced status and command/control behaviours; recruitment practices reinforced the great man theory of leadership; cognitive-based educational programmes reinforced dependency and organisational control. These disconnections created mixed messages in the organisation and hampered the organisation's ability to develop effective leaders. As we progress into Industry 4.0, we need to learn from these mistakes and ensure these pillars are better aligned, connected, and support responsive and swarm leadership, and also to embrace connectivism and the new digital thinking that knowledge is 'distributed across a network of connections' and based on 'rapidly altering foundations'.[32]

From Dependency to Readiness

We need to change leadership development culture away from needy leaders who depend on the organisation, to leaders who can stand alone and be ready

to lead in the moment. In the previous section, we introduced the idea of a glass container to encapsulate the traditional approach to leadership development. In the horizontal approach to developing leaders, traditional companies own and control leadership development by constructing leadership frameworks, pyramids and pipelines that saturate leaders with knowledge, categorisation skills, and competencies. The identified problem with this approach is that it reinforces lateral growth—leaders come away being knowledgeable about leadership, but they struggle to transfer this knowledge into a set of adaptive behaviours that can help them in unpredictable environments. Horizontal development, in both cognitive and social learning, simply does not prepare the leader to think and lead outside of the container—to be responsive and adaptive to the challenges of the VUCA world. It teaches cognitive dependency through structured transactional tools that are fit for purpose for a contained and logically structured organisation, fortressed and barricaded against the complex world. We need to develop our leaders in a new vertical way. Vertical development requires an organisational shift towards more open/networked structures, a mindset shift from dependency to readiness, and a constructivist shift from director to connector. In an increasingly complex workplace and a volatile, uncertain, and ambiguous economic environment, leaders need to be more responsive, preemptive, and adaptive to their protean surroundings. The glass needs to be smashed and leaders need to operate outside of the fixed and regimented structures that organisations strap them into. We need to go from leadership development as something that is 'done' to somebody to a truly transformational leadership where the leader takes ownership of their individual development and leadership journey.

Here we segue from horizontal to vertical development and Susan Cook-Greuter's theory of vertical growth that makes up part of her ego development theory (EDT). Cook-Greuter envisions human development as a spiral which increases growth, maturity, and perspective rather than a more traditional idea of human development as a 'lockstep', to use Susan Cook-Greuter's term. Cook-Greuter suggests three possible configurations in human development: horizontal and 'lateral expansion'; vertical learning (which is about a 'more integrated perspective'); and vertical down which is the 'temporary or permanent regression due to life circumstances, environment, stress and illness.'[33] Susan Cook-Greuter sees vertical development occurring over a lifetime where 'the whole previous meaning system is transformed and restructured into a new, more expansive and inclusive self-theory and theory of the world.'[34] As Nick Petrie expresses it, vertical development refers to the 'advancement in a person's thinking capability—a meta dynamic to leadership. The outcome of

vertical stage development is the ability to think in more complex, systemic, strategic, and interdependent ways.'[35]

The future of leadership development is in vertical growth where we break away from trying to fill leaders with endless recycled behavioural competences, skill and categorisation frameworks that impel emerging leaders to think and act in ways that the organisation determines (which produces lateral and horizontal growth), towards a truly transformational path where leaders learn to think and act for themselves in more responsive and agile ways. Plutarch's story from de Auditu comes to mind:

> If a man comes to another to share the benefit of a discourse, and does not think it necessary to kindle from it some illumination for himself and some thinking of his own, but, delighting in the discourse, sits enchanted; he gets, as it were, a bright and ruddy glow in the form of opinion imparted to him by what is said, but the mouldiness and darkness of his inner mind he has not dissipated nor banished by the warm glow of philosophy.[36]

To acquire this kind of responsive leadership, a major step change needs to happen in our approach to developing leaders at the behavioural, cognitive, constructivist, and connectivist level. We need to prepare and educate our leaders in a different way than the current Industry 3.0 individualistic approach. We need to adopt a whole systems and vertical approach to developing leaders.

The next three chapters explore in detailed and practical ways how we can update these outdated and misapplied learning theories and legacies which encourage superherodom and dependency, towards more vertical growth that induces a more responsive and agile leadership behaviour and is reinforced by the very system itself.

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4

Leadership Development and Structure—From Egosystems to Ecosystems

How often have you seen leaders pack themselves off on residential leadership programmes and return to the office a little different—more humble and open to ideas? It tends to wear off, of course, as they get back into the daily routine of decision-making, managing staff, and directing operations.

The challenge for leaders such as Caroline who attend residential leadership programmes that seek to transform behaviours is how to maintain the momentum of personal transformation when the organisational structures around them reinforce their positional power, hierarchical status, and decision-making authority. Andrea Derler, Anthony Abbatiello, and Stacia Garr relate this to a fishpond, 'Up until now, companies have focused primarily on training the "fish"—the individual leader or high-potential candidate—but have neglected the "pond"—the company culture and context—in which the fish swims.'[1] It simply isn't enough or effective to mentally reconfigure individual leaders in isolation from the broader ecosystem in which leaders lead. To survive Industry 4.0, organisations need to rework the rigid structures, dating back to the last century, that have undermined the transformational effort — they need to reduce organisational drag and eliminate oppressive operant conditioning and reward systems that undermine engagement and collaboration and promote positional power.

The fact is that we shape our systems, and then our systems shape us. This idea is attributed to Winston Churchill. In October 1943 Churchill addressed the House of Commons in a debate concerning the rebuilding of the Commons Chamber in Westminster in keeping with its former rectangular shape following its destruction during the Blitz of World War 2 and he said,

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R. Kelly, *Constructing Leadership 4.0*, https://doi.org/10.1007/978-3-319-98062-1_4

'We shape our buildings and afterwards our buildings shape us.'[2] Structures influence us in different ways. Concerning organisations, human behaviour works differently in egosystems than ecosystems. Egosystems foster self-interested power, control, and possession; ecosystems foster collaboration, partnership, and support.[3]

This chapter explores the merits and demerits of different structural designs in relation to the flow of decision-making, knowledge, information, and ideas. The conclusion will be that agile, responsive, collaborative, connected ('swarm') leadership behaviours will be necessary in the hyperconnected and volatile era of the coming fourth industrial revolution, and that these behaviours will only blossom in open, decentralised structures. Organisational decision-makers must address the thorny issue of structural design and its impact on organisational and leadership behaviour when thinking about developing future leaders.

Centralised (Closed) Structures

In 2017, investment bank staff at Barclays, London, were perplexed by the sudden appearance of little black boxes underneath their work stations. It transpired that these boxes were tracking devices with heat and motion sensors that were monitoring the length of time employees spent away from their desks. This resulted in a flurry of articles over the summer concerning the electronic surveillance of employees in major companies in London's financial district.[4] Surveillance in the workplace has been a central feature of organisational culture since organisations began. Industry 1.0 saw a shift towards centralised production that was intended to create efficiency but quickly morphed into patriarchal supervision and control. In the late 1700s, Samuel Bentham, who was managing various industrial projects in Krichev, Eastern Europe, for Prince Potemkin, was visited by his social theorist and philosopher brother, Jeremy Bentham. Samuel showed him an idea of a circular building where a small number of managers could oversee a large number of unskilled workers. Jeremy Bentham was intrigued by the idea and developed the panopticon which was used in modern prisons where a warden could simultaneously view multiple prison wings. The idea, however, had its roots in worker surveillance in the emerging industrial factories. The French philosopher Michel Foucault developed the idea of the panopticon in his book *Discipline and Punishment*, linking panopticism to the principle of power and control:

> He who is subjected to a field of visibility, and who knows it, assumes responsibility for the constraints of power; he makes them play spontaneously upon himself; he inscribes in himself the power relation in which he simultaneously plays both roles; he becomes the principle of his own subjection.[5]

There has been a long history of controlling and manipulating employee behaviour through coercive structures and conditioning.[6] The first employee time clock was invented in 1888 by Willard Bundy and steam whistles were used in early factories to signal end of shifts. The scientific explanation for this came from the research into classic (stimuli-response) conditioning carried out by Ivan Pavlov, Edward Thorndike, and John Watson and Rosalie Rayner.[7]

As we saw in Chap. 1, early management theorists, including Frederick Taylor, Henri Fayol, and Max Weber, were all about maximising efficiency and productivity.[8] The persistent hum and flow of the scientifically managed assembly line with stopclocks, bells, whistles, and sirens drove the workers relentlessly on in their 'own subjection'. Chaplin uses the theme of the conditioned assembly line in *Modern Times* where the protagonist disrupts the unrelenting flow of the assembly line to great comedic effect. It reinforces David Gray and Thomas Vander Wal's maxim, 'The more idiot proof the system, the more people will act like idiots.'[9]

As behaviourism developed in the 1940s and 1950s under the influence of B.F. Skinner, operant conditioning was used in twentieth-century office structures in the more subtle forms of 9-5 presentism, promotion, annual reviews, goal setting, personal score cards, bonuses, and disciplinary procedures.[10] These conditioning systems were adopted by many corporates. As we have seen, behaviourism also influenced the modern obsession with measuring work and employee productivity.[11]

For the last 40 years, progressive organisations have been looking at their organisational structures to see how they can soften structural reinforcers in order to reduce dependent behaviours and maximise personal motivation. Most evident was the shift toward open planned offices and hot-desking. In recent times, there has been a drive to dismantle the negative reinforcers[12] that contribute to old-style leadership behaviours and employee disengagement in order to quash the tenacious structural and conditioning legacies.

Centralised/closed systems rely on rigid structures, standardisation, regulation, secrecy, and a culture of worker surveillance and control. Profiled below are two classic centralised structures.

Patriarchal Organisation

Patriarchy comes from the Greek patriarkhēs and literally means 'the rule of the father'. This was the organisational model favoured in early industrial organisations where you have a single factory owner in charge of production. In the industrial revolution, workers shifted from small cottage industries and craft work to organised steam-powered factories owned and run by local businessmen. This patriarchal setup meant that the locus of authority was centred around factory owners. This led to some well publicised ill-treatment of workers at the hands of these owners, some of whom used child labour and abused and exploited their employees.[13] Government legislation and regulation throughout the nineteenth century reformed working conditions and regulated the employment of women and children in factories.

Patriarchal organisations have sharply declined over the centuries but there are still family-run businesses and entrepreneurial start-ups where patriarchal behaviours persist. Indeed, pockets of patriarchal behaviour even exist within large organisations and corporates. The wielding of power in these modern patriarchies may not be as brutal as eighteenth- and nineteenth-century models, but subtle forms of power and control take place.

Patriarchal setups tend to function though positive and negative reinforcement with a master/slave or parent/child[14] dynamic. Patriarchal organisations benefit from quick decision-making but are notably lacking in diversity of ideas and approaches.

Hierarchical Organisation

It is easy to see why organisations have been seduced by pyramidic structures—they help organise complex work in an efficient way. Such a system allows for rapid organisational change, standardisation, cost effectiveness, people management, and quick decision-making. Hierarchy seems to be society's default preference for structuring and organising itself.[15] Crumley defines hierarchy as composed of 'elements which on the basis of certain factors are subordinate to others and may be ranked'.[16] This organisational design, which dominated the twentieth century,[17] is prevalent in large organisations such as 3M, heavy industry such as US Steel and Bethlehem Steel, and predict-and-control planning environments such as the military. Hierarchies have many critics such as Pedro Pablo Ramos, Brian Robertson,

and Gray and Vander Wal.[18] That said, hierarchical structures also have champions. Eliot Jacques, writing for the *HBR*, says, 'Properly structured, hierarchy can release energy and creativity, rationalize productivity, and actually improve morale.'[19] In 'Why Hierarchies Thrive', the late Harold Leavitt observes:

> Hierarchies provide clear markers that let us know how far and fast we are climbing the ladder of success: Clerks can become department heads, corporals can move up to sergeants, and parish priests can rise to bishops. Often those markers are symbolic, such as corner offices, enriched titles like assistant vice president, or employee of the month. Why do such seemingly trivial measures so often succeed? Perhaps because we want to be evaluated, and hierarchies offer us report cards in the respectable form of performance appraisals, salary increases, promotions, bonuses, and stock options. We may grouse about unfair evaluations and meager raises, but most of us seem to want to see our grades … Hierarchies give us more than these somewhat questionable measures of our worth; they give us an identity.[20]

From a leadership perspective, a closed hierarchical organisation organises work along the lines of positional status which results in centralised decision-making and decreases the opportunities for collaboration and cross-functional innovation. The fourth industrial revolution, defined by distributed flows of information, decisions, and innovation across internal and external collaborative networks, will prove to be the death knell of hierarchy.

Decentralised Structures

Steve Jobs said in an interview at the D8 conference, 'You have to be run by ideas, not hierarchy'.[21] The drawbacks of centralised organisational structures became increasingly apparent as post-war organisations moved from product-centric to consumer-centric output. Senior leadership, barricaded in executive suites, were out of touch with post-war customer needs and product development. The story of Kodak Eastman and the digital camera beautifully exemplifies the point. If you go to the National Inventors Hall of Fame in Alexandria, USA, among the 500 plus plaques honouring such people as Alexandra Graham Bell, Samuel Morse, Thomas Edison, and Steve Jobs, you will see one in honour of the less well-known Steven Sasson. He was an American electrical engineer at Eastman Kodak who invented the first digital camera in 1975. The first digital camera to be sold on the

market was the DS-X Fuji camera which appeared 14 years later in December, 1989. It begs the question: how come an American invention was manufactured and made successful by a Japanese company? The reason has to do with leadership and historical context. Sasson joined Eastman Kodak in 1973 and was given a small project to work on—the kind of trivial assignment given to new entrants to keep them out of trouble. His task was to see if there was any practical application for the recently invented pixel technology. Sasson worked out how to digitally store these pixels, and digital photography was born. He first developed a prototype with a playback system that could display images on a TV set and showed it to senior leaders in Kodak. The idea bombed. He was told that it worked against Kodak's business model and that print was the established medium (Kodak made its profits from processing film rather than selling the cameras). Leadership also questioned the concept of future customers looking at pictures on a screen. In 1975, Kodak commanded 90% of film sales and 85% of camera sales in the US.[22] In 2012, Eastman Kodak filed for bankruptcy because it had been 'struggling for years to adapt to an increasingly digital world'.[23] The Japanese company Fujifilm, which manufactured the first digital camera, on the other hand, is still a multi-billion dollar producing company.[24] Moreover, the entire world is looking at 1.2 trillion pictures on a screen.[25] Many case studies of Eastman Kodak focus on how the company failed to exploit the changing technology. A deeper analysis, however, reveals this to be a personal story of how an out of touch leadership team were so entrenched in their thinking that they missed one of the biggest opportunities in corporate history. It was the same entrenched thinking that caused Xerox to lose out to Canon, and the traditional Swiss watch industry to lose out to Seiko electronics.[26] This led to a lot of soul-searching from US companies in the 1980s and 1990s. They decentralised their structures and redefined their companies more through product lines and easier routes to market/customers with devolved employee decision-making.

Many organisations have experimented over the years with different forms of flatter structures, including delayerment, reducing middle management, simpler structures, open planned offices, and self-managing teams.[27] The traditional office structure has been in steady demise. Deloitte's recent *Human Capital Trends Survey* suggests that only 38% of companies are now 'functionally organized'.[28] For large companies with more than 50,000 employees, that number shrinks to 24%. These organisations are moving away from top-down hierarchies, causing dramatic headlines such as Bloomberg's 'The Office Hierarchy is Officially Dead'.[29]

There are different gradients of decentralisation and as a rule of thumb the more decentralised the structure, the more potential for collaboration and shared decision-making. Profiled below are two decentralised business models.

Matrix Organisation

The matrix structure is characterised by multiple command systems set up as a grid rather than a traditional hierarchy. It is a hybrid between a centralised function and decentralised divisions/projects. The concept and term were first employed in the 1960s by the aerospace industry that was bidding for a government contract. As part of the tender process, charts were developed to show the structure of the project team and its relation to the overall functional management structure of the organisation—they represented the project groups as a horizontal addition to their existing vertical hierarchies, which denoted a dedicated resource to the government project that still had continuity and accountability to the larger organisation. The matrix structure has collaborative project groups at its heart. Collaborative project teams, conceptualised in the 1900s and influenced by Mary Parker Follett, Elton Mayo, and Chester Barnard,[30] became commonplace during the post-war boom fuelled by population and urbanisation growth which led to 'mushrooming product lines and organizational complexity'[31] that was best served by a divisional and not functional structure. The divisional model was created by General Motors and DuPont in the 1920s away from the unity form structure (U-form) to the multi-divisional form (m-form or mdf). At the same time, there were still significant capital investment projects that required centralised corporate decision-making—the matrix structure that accommodated the horizontal and vertical structures in a single chart provided a ready solution.

The matrix system has some key advantages in that it ensures the optimum utilisation of skilled personnel, focuses on both cost and quality, and motivates employees by focusing their attention on the completion of a project without having to fuss about their day job and their functional boss. It also means that employees can be exposed to different working environments and networks, which helps develop the individual and organisational learning experience.[32]

That said, it also has significant drawbacks. Reporting to different stakeholders and having multiple lines of authority inevitably results in some morale issues and conflicting priorities arising from the various stakeholder interests. In addition to these power struggles and insecurities, there are excessive overhead costs due to dual staffing of management positions and complexities around performance management and staff evaluation.

Company Profile: Starbucks

Starbucks is a multinational coffee chain. It opened its first coffee house in Pike Place Market, Seattle, in 1971. There are over 28,000 stores in 76 countries employing over 300,000 people. The 2017 revenue was $22.4 billon.[33] Starbucks has a matrix organisational structure which includes centralised functional structures such as finance, HR, and marketing, but it also has a matrix of different divisions and teams. It has three regional divisions in Europe/Middle East/Africa, Russia/China, and Asia Pacific/Americas. It has a product division related to such things as coffee, baked goods, and merchandise. Moreover, Starbucks has a team structure—workers from individual coffeehouses will be part of a geographical team where they can make local decisions to enhance local customer needs and relationships, but key decisions around product need to go through a product stream. Also, there is a functional component to do with brand, employee conditions, and financial management. So it gives some flexibility for individual coffeehouses to make local decisions about products and customer needs within a broader matrix of product, geographic, and functional decisions. This matrix model emerged because CEO Howard Schultz sought to focus again on customer experience through divisional team models after Starbucks had expanded too rapidly in the global market and had lost touch with local customer experience.

Strategic Business Unit

A strategic business unit (SBU) is a unit of the business (a division, product line, or brand) that operates as an independent entity, with its own strategic vision, direction, and supporting functions, but falls under the profit centre of the parent enterprise, allowing for a creative use of shared resources.

This model works for organisations that have multiple product lines and categories such as LG which manufactures a diverse range of consumer durables such as phones, refrigerators, washing machines, televisions, and air conditioners. Each of these product lines have different markets and, therefore, it makes sense for LG to have a SBU structure where each line is run independently, allowing it to target particular groups of customers or geographical locations under the LG global band.

A key advantage of a shared resource pool can quickly become a disadvantage with SBUs, leading to confusion and frustration by employees who have dual or multiple reporting relationships which can result in organisational

tensions regarding shared resources such as the inability to access resources for projects. Moreover, multiple independent product lines can lead to coordination problems with the overall parent enterprise.

Company Profile: Walt Disney Company (Disney)

The Disney Company mission is to be one of the world's leading producers and providers of entertainment and information.[34] Founded in 1923 by brothers Walt and Roy Disney and originally listed as the Disney Brothers Cartoon Studio, it operates in 45 countries and employs 195,000 people,[35] 70,000 of whom work in Disney World as 'cast members'.[36] It comprises of five SBUs: media networks, parks and resorts, studio entertainment, Disney experience and consumer products, and Disney direct-to-consumer and international. Each SBU has its own brand, but is bound by a parent enterprise with a management team and board of directors who coordinate global strategic decisions and are the guardians of the overall Disney experience and brand. The Disney Company collective revenue in 2017 was $55.14 billion with $23.5 billion generated by media networks and $18.4 billion from parks and resorts (the two largest revenue producers).[37]

In the words of its former Senior Executive VP and CFO, Jay Rasulo, the Disney Company structure means they have a 'very clear strategy of an ecosystem in which we both own the franchises and own the means of distribution to get those franchises out across almost all consumer touch points'.[38]

Ecosystems

Jack Welch, former CEO of GE, and his executive team wrote in the 2000 GE Annual Report, 'We've long believed that when the rate of change inside an institution becomes slower than the rate of change outside, the end is in sight. The only question is when.'[39] In the future, companies need to connect not only internally, but externally with suppliers, customers, and consumer groups. This means moving more towards adaptive ecosystems. As we have seen, decentralised structures such as a matrix organisation and SBUs are hybrids between hierarchical and non-hierarchical structures. An ecosystem breaks away entirely from such rigid structures and connects across organisational boundaries. As General Stanley McChrystal et al. remark, 'The models of organizational success that dominated the twentieth century have their roots in the industrial revolution and, simply put, the world has changed.'[40]

As we move towards a hyperconnected global community, the old prescribed structures that functioned along the laws of supply and demand need to be ditched in favour of an emergent connectivist leadership that embraces the idea of collaborative networks. Ecosystems are a complex interconnected network of self-managing and collaborative agents which include a mix of employees, stakeholders, partners, and customer communities that are positioned outside of the traditional organisational boundaries and firewalls. It is becoming increasingly clear to organisational commentators and designers that the only organisational system that will accommodate a frictionless flow of ideas, data, and learning across complex networks and collaborative hyperconnected communities, will be flexible/adaptive ecosystems.

Two important intellectual influences on the development of ecosystems are complexity theory and Jon Husband's theory of Wireacracy.

We have seen that Industry 4.0 is bringing with it more volatility, uncertainty, complexity, and ambiguity. The complexity theory is a useful approach that helps build understanding of this kind of uncertainty and seeks to uncover special traits within complex systems where seemingly independent agents spontaneously form coherent systems. Evolving from 1960s systems theory, complexity theory became influential in the mid-1980s onwards with the establishment of the Santa Fe Institute in New Mexico led by George Cowan. Spanning several scientific fields, it has been applied to organisational studies as a way to show the complex nature of organisations. Traditionally, organisations were viewed as simple machines and linear structures.[41] Researchers in complexity theory such as Howard Sherman and Ralph Schultz, Thomas Hout, Richard Pascale et al., and George Rzevski and Petr Skobelev[42] argue that business and organisations are far from linear and are, in fact, organic and complex adaptive systems that have an undercurrent emergence rather than top-down order.[43]

Ecosystems are complex adaptive systems; they are non-linear, interactive/networked, emergent, self-organising, and co-evolving. There is no centralised authority in complex adaptive systems, only coherent system behaviour shaped by healthy competition, cooperation, and collaboration between human agents (and increasingly, machines). It is a 'try something and see what happens' environment.[44]

Husband describes Wirearchy as a 'dynamic two-way flow of power and authority based on knowledge, trust, credibility and a focus on results, enabled by interconnected people and technology.'[45] As we move towards a connected

global society, organisations need to rewire themselves to accommodate internal and external networks. Learning how to organisationally operate in this interconnected field is key and Wirearchy is an 'emergent organizing principle' for complex ecosystems.[46]

Below are four ecosystems, each supported by a case study.

Team-Led Structures

Team-led structures are essentially an inverted pyramid. In a classic pyramid structure, the decisions are made at the top and are fed down the line through teams. In a team-led organisation, the decisions are made in teams or pods and fed up to the executive. As General Stanley McChrystal argues in *Team of Teams*, 'In a command, the connections that matter are vertical ties; team building, on the other hand, is all about horizontal connectivity.'[47] Many notable organisations have flirted with team-led initiatives. IBM has experimented with 'agile management',[48] in which self-governing teams have regular 'scrums' to decide the next 'sprint', or stage, of the project. GE rolled out FastWorks, a system inspired by Silicon Valley's 'lean startup' movement, itself inspired by agile management.[49] At the heart of team-led structures is the ability to self-manage and self-decide. In *Reinventing Organizations*, Frederic Laloux created the Teal organisation which is a colour-coded system where the colour teal signifies self-organising small teams that decide and innovate in a fluid and adaptive way whilst taking on roles that include traditional management functions.[50] This is in contrast to other colour-labelled organisational styles that Laloux explores (red, amber, orange, and green) which have more traditional and fixed structures. Typically, teams should be of a manageable size such as defined by the Rigelmann effect or Jeff Bezos' two pizza rule.[51] The advantage of team-led organisations is that employees are closer to customers and feel part of the organisational decision-making. A clear disadvantage is coordinating all of these team ideas into a macro strategy.

Company Focus: Whole Foods

For a long time, Whole Foods has been a case study in team-led organisations. Whole foods, founded in Austin, Texas, in 1980, is a world leader in natural organic foods and sustainable agriculture. It currently has more than 400 stores in North America and the UK.[52] It was acquired by Amazon for $13.7 billion on August 28, 2017. There is much commentary that the culture of

Whole Foods is now changing with online delivery, price cutting, changes to its supply chain[53] store expansions, and layoffs.[54] One of Whole Foods' core values is to promote team member growth and happiness—'Our success is dependent upon the collective energy, intelligence, and contributions of all of our Team Members.'[55] As David Burkus writes in this pre-acquisition *Forbes* article, Whole Foods entire ethos and operation was founded on teams:

> The teams have a remarkable degree of autonomy, helping to decide what to order, how to price items and how to run promotions. Even outside the store, a team focus continues up the chain of command all the way to the top.[56]

This is all set to change as tensions are surfacing between Amazon and Whole Foods team members and traditional customers concerning what products Whole Foods should stock.[57] This is an evolving story and may well in the future become a case study in the culture of corporate takeovers.

Lattice Structure

The lattice structure is the brainchild of W.L. Gore Associates, Inc., co-founders Bill and Vieve Gore. It is a self-managing structure that focuses on three lattice approaches: individual employee career choice, flexibility/customisation of work schedules, and an opportunity for employees to contribute laterally and freely across the organisation and make key resourcing decisions about where they can add value to projects and their careers.[58] Often characterised as a 'bossless' structure, one of its core characteristics is that it has no obvious hierarchical authority. Inspired by Abraham Maslow and Doug McGregor,[59] Bill Gore believes, 'a lattice organisation is one that involves direct transactions, self-commitment, natural leadership, and lacks assigned or assumed authority.'[60] Deloitte adopted the lattice organisation in 2005 and recommended it to some of its clients.

The benefits of a lattice structure include employee participation in a shared talent pool where they gain broad cross-functional knowledge of all aspects of the operation and the fact that it is a highly flexible model that drives self-empowerment, engagement, retention, productivity, and balances working lives for the individual whilst enabling organisational adaptiveness. Disadvantages of this approach includes a clear lack of talent management strategy, the reliance on individual self-discipline, no compensation or performance-related incentives, and an increase in organisational costs and inefficiencies through the lack of standardisation and compliance.

Company Profile: W.L. Gore & Associates

W.L. Gore & Associates, Inc., is a US manufacturer specialising in chemical-based products such as medical implants, fabric laminates, and fibre technologies.[61] It was founded on January 1, 1958, in Newark, Delaware, by Wilbert L. (Bill) and Genevieve (Vieve) Gore in the basement of their home. It was ranked in the 2017 *Forbes America's Largest Private Companies* as the 135th largest private company with a $3.2 billion annual revenue.[62] It employs approximately 9500 worldwide 'Associates' who hold shares in the enterprise. It has offices in more than 25 countries, with manufacturing operations in the US, Germany, UK, China, and Japan.

On their website they explain the history of the lattice structure within the company and how it translates to company culture.[63] They have associates, leaders, and sponsors. Everyone is an associate and each associate has a personally chosen sponsor who focuses on the development and growth of the associate and ensures associates are fairly paid. Associates do not work within traditional (hierarchical) structures but interact freely across the organisation. Associates make independent choices about the teams they join and how they contribute to the organisation. These teams form their own plan of action rather than being directed. Leaders are associates who have developed followers and they focus on business opportunities and objectives and strategic alignment. They are united behind a fundamental belief that every associate has the potential to help Gore grow and succeed through small teams and the lattice structure and that each associate is equal. The three guiding principles of the company are freedom, fairness, and commitment. If associates act or perform 'below the waterline', a collective and consulted decision is made concerning their fate.

Holacracy

Holacracy, a 'practice' developed by Brian Robertson,[64] has its origins in the term 'holon' that was coined by Arthur Koestler[65] from the Greek 'holos' meaning whole, and 'on' meaning a particle or part—a self-organising part in a broader whole that acts interdependently. Robertson describes the principle of Holacracy as looking like a 'set of nested circles', like cells within organs within organisms.[66] In a Holacracy, each part or holon is not subjugated to those above it, but retains autonomy, individual authority, and wholeness. So we have got a Holacracy of roles grouped within circles, which are themselves grouped within broader circles, all the way up until the biggest circle,

containing the entire organisation. In practice, Holacracy is about working and organising in a less hierarchical way where power is transferred from senior management to written constitutions and 'peer-to-peer' self-managing networks or teams. These circles and sub-circles are dedicated to particular functions and are governed by roles rather than job grades/descriptions. More formal governance includes a transparent constitution, 'lead links' who represent the circles and sub-circle at governance meetings, the General Company Circle (GCC), which a 'super circle' setting company-wide priorities and guidance, and the 'anchor circle' which includes board members. Robertson says, 'Each circle governs itself by uncovering the roles needed to reach the aim of the circle, and assigning circle members to fill them.'[67]

The advantages of Holacracy includes distributed authority, collective decision-making, innovation, diversity, quick action based on supplier and customer input, and an adaptive, accountable, and fully engaged culture. There are, however, some highly publicised challenges to Holacracy. In March 2016, Medium, one of the flagship companies that adopted Holacracy, announced in a blog release that it had decided to 'move beyond Holacracy'.[68] The reasons given gets to the core operational challenges of a holacratic structure. It is difficult to coordinate (Medium considered it 'time consuming and divisive to gain alignment'), it actually increases bureaucracy because of the codification of the roles and responsibilities, it attracts negative headlines, and deters potentially good candidates from applying to work there. Additionally, more attention and resources need to be given at the recruitment and development stage as a distributed authority structure does not appeal to everybody (18% of staff left Zappos when it converted to Holacracy) and can impact professional identity and cost additional investment in promoting Holacracy to new employees. What is more, Holacracy doesn't fix systemic issues such as bad leadership, failing business models, and low trust, but simply uncovers them. Jon Husband queries the manner in which Holacracy has been rolled out:

> The organization's activities are in effect directed by a constitution with which all workers must align (the infamous *the boat is leaving the dock, you're either on board the boat or you're not* approach to organizational change used whenever a new strategy or a vision and mission are introduced).[69]

Company Profile: Zappos

Zappos promote themselves on their LinkedIn profile as a 'leader in online apparel and footwear sales'.[70] Nick Swinmum founded an online shoe retailer (originally called shoeSite.com) in 1999 after a frustrating time shopping for

a pair of shoes in his local San Francisco Mall. CEO Tony Hsieh invested $500,000 of his own money in the company when it was launched.[71] Zappos was acquired in 2009 by Amazon.com for a reported $1.2 billion.[72] In 2017 it recorded 3144 employees with an estimated revenue of $512.86. On March 24, 2015, Tony Hsieh, CEO of Zappos, sent a memo to all Zappos employees detailing the transition to Holacracy. In his memo, Hsieh outlined some misconceptions and benefits of self-management and ended with a dramatic offer to company-wide employees to take a severance package if they felt self-management and self-organisation was 'not the right fit'[73]; 260 (18% of the company) decided to take the offer and quit. To date, Zappos is the largest organisation to become holacratic.

On their website, *Zappos Insights*, is a quote by Hsieh who likens Holacracy and Zappos to the structuring of a city:

> Research shows that every time the size of a city doubles, innovation or productivity per resident increases by 15 percent. But when companies get bigger, innovation or productivity per employee generally goes down. So we're trying to figure out how to structure Zappos more like a city, and less like a bureaucratic corporation. In a city, people and businesses are self-organizing. We're trying to do the same thing by switching from a normal hierarchical structure to a system called Holacracy, which enables employees to act more like entrepreneurs and self-direct their work instead of reporting to a manager who tells them what to do.[74]

Zappos spreads its culture through its core values highlighted in its 2014 culture book,[75] one of which is a commitment to delivering WOW through training initiatives including its three-day culture camp.[76]

Danielle Kelly, a former manager and now a 'lead link' at Zappos, explains in an interview for *Business Insider* how Holacracy works in practice.[77] Circles are formed via invites posted on an internal self-management tool, based on emerging areas of need which can be created or disbanded at any time. 'Roles' are stewarded by a 'lead link' who 'are not managing the people [but] representing the circle as a whole and its purpose within the broader environment of the organization.'[78] Representative (Rep) links are nominated by the sub-circle and represent issues arising from the sub-circle group. Performance and compensation is determined across the organisation by fellow employees using a system of badges, where colleagues award badges for good work. Employees can hold multiple roles in different circles across the organisation which makes it possible for employees to move fluidly throughout the circles and for the organisation to have ongoing rapid iterations and change. This creates a self-organising and protean enterprise.

Swarm Enterprise

If an anthill is disturbed, one of the most extraordinary spectacles in the natural world occurs. The colony—or 'superorganisms' as they are sometimes known[79]—swarms together in a supremely efficient way that includes a sophisticated use of shared resources and divided labour with clear roles and responsibilities, collective thinking,[80] shared problem solving, colony first behaviours,[81] supreme agility, and distributed authority.[82] It is an efficient, flexible, emergent, robust, self-organising system that sweeps down on the crisis and knows exactly how to handle it. A body of researchers[83] have applied lessons from ants and other social insects, such as honeybees and termites, to organisations under the headline of swarm intelligence and swarm organisations. Gloor writes, 'The future of business is swarm business—whether it is Uber, Airbnb, Tesla, or Apple, it's not about being a fearless leader, but about creating a swarm that works together in collective consciousness, to create great things that change the world.'[84]

The swarm enterprise is designed to be flexible, efficient, robust, emergent, and self-organising. Eric Bonabeau and Christopher Meyer opine that social insects have been successful due to three characteristics: flexibility, robustness and self-organisation.[85] Swarm organisations are still 'under construction' but some clear characteristics are emerging.

1. Swarm Organisations Are Highly Collaborative with Collaborative Networks Collaborative networks, or CoIN as Peter Gloor calls them,[86] are cross-functional networks that span in and outside of the enterprise. Direction, ideas, and decisions are formulated through these flexible and self-organising networks via the use of algorithms and data mining technology. The next chapter focuses on these collaborative networks. The idea of swarm differs from some of the other ecosystems we have been exploring such as Holacracy. Holacracy is largely an organising practice of internal circles of teams, each with roles and responsibilities, that are focused on specific challenges in a broader net of circles that set company-wide strategy and direction. Swarm organisations are wired together through collaborative networks with internal and external contributors who collaborate together creating platforms of ideas, decisions, and strategic approaches.

2. Swarm Businesses Have Limited Structure, Governance, and Regulation The enterprise is structured around connectivity and relationships with customers, suppliers, commentators, and competitors and not on principles of internal organisational governance. Figure 4.1 is a depiction of a

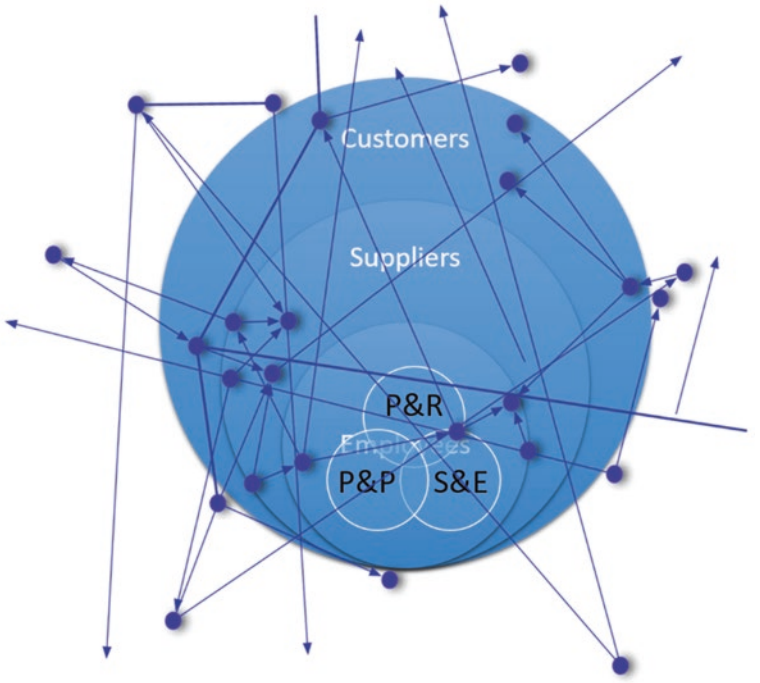


Fig. 4.1 Example of a collaborative network within a swarm business

collaborative network within a swarm business with three domains (customers, suppliers, and employees). The employee circle has a nest of domains with an executive at the centre. The network is spread both within and outside of these domains.

Like a queen bee, the executive is not the decision-maker but grows and nurtures the enterprise by acting as a sensemaker and connector—ensuring the system supports collaboration and that ideas and decisions are hatched. The colony looks after their executive (and not the other way around). The core functions (people and resources, platform and processes, and strategy and execution) are broad to allow for an intersectionality of ideas.[87] People and resources include recruitment, development, remuneration, and culture. Platform and process will include everything needed to make the enterprise operate such as network, systems, finance, and technology. Strategy and execution includes everything to do with the hatching and commercialisation of ideas, including manufacturing and marketing. An important part of swarm intelligence is the 'peer-to-peer connection between (decentralized) teams'.[88]

3. Swarm Enterprises Need to Be Designed To create a swarm enterprise the old organisation will need to decentralise to make way for ecosystems with distributed authority and management. This may require some radical changes to eradicate conditioning practices and structures that reinforce and reward behaviours.

- End of year appraisals need to be scrapped. Some companies such as Accenture, Deloitte, Adobe, IBM, General Electric, SAP, Microsoft, Dell, Medtronic, Gap, and Cargill are already starting to do this, opting for more regular feedback and ongoing performance conversations.[89]
- Performance-related bonuses need to be ditched. Companies such as Woodford Investment Management have experimented with this idea.[90]
- Staff ranking needs to be shelved. Microsoft did this in 2013.[91]
- Job titles need to be eliminated. This is precisely what Zappos did in 2014.
- Regulations need to be simplified and express in easy to understand and behavioural-based language. Eric Bonabeau and Christopher Meyer argue, 'the most powerful—and fascinating—insight from swarm intelligence is that complex collective behavior can emerge from individuals following simple rules. For social insects, millions of years of evolution have fine-tuned those rules for great efficiency, flexibility, and robustness. Can managers develop similar rules to shape the behavior of their organizations and replace rigid command-and-control structures?'[92] This was one of the criticisms that Medium had of Holacracy where there were too many complex rules and procedures. They replaced this with six clear principles that captured the overall mission, culture and approach of their organisation.
- Recruitment needs to be aligned to the change initiative. As we have seen in the case study, Zappos retained and recruited individuals who were comfortable and inspired working in an ecosystem environment.

Listed below are some generic design principles that organisations need to keep in mind when transitioning away from centralised structures towards a swarm enterprise (every company will have a different starting point and a different set of challenges).

- Come with a unique solution and avoid a pick and mix of benchmarked best practices.
- The structure of organisations needs to follow the law of demand. Look deeply at your organisation and examine forensically the flow of information and how interconnected you are to the market and consumers. Understand your business and what kind of relation you want to have with your customers.

- Involve as many people as possible in the reorganisation effort. Start with the mindset of eliminating rank and status and presume that everyone can make an input. Cultivate the Medici effect by bringing people of different disciplines, experiences, and qualifications together to come up with intersectional ideas about the best tailored organisational structure. Be prepared to listen deeply to all views.
- Design around customers but appreciate the strength of the organisation and don't throw away its soul. Fred Reichheld and Rob Markey say, 'Most corporate systems were not built with customer delight in mind.'[93]
- Be bold.
- Run pilots.
- Communicate the change.
- Be patient.

Creating a swarm enterprise has obvious advantages within the context of the fourth industrial revolution. It is a fit for purpose design that has collaboration, flexibility, and self-emergence at its core. The ability to intersect with a diversity of cultures, experience, and thinking enriches ideas. By involving customers, stakeholders, partners, competitors, and interest groups, it allows for a broad input of ideas and direction and has an immediacy where collaborators can swarm behind trends and ideas. Moreover, because it is built on co-creativity and collaboration, there should, in principle, be fewer surprises in the system.

There are of course challenges. This is a radically new way to innovate and make company decisions. It will require a lot of communication and change initiatives to sell the idea to traditional organisations. The effort of eliminating management structures, creating networks, and installing new systems and technology will be highly disruptive and capital intensive. In common with other ecosystems, it requires a certain employee mindset where employees are accepting of an open culture. An education programme will be necessary—the topic of Chap. 5.

Company Profile 1: Daimler AG

Daimler (formally known as Daimler-Benz AG, 1926–1998, and Daimler Chrysler AG, 1998–2007) is a producer of premium cars, commercial vehicles, and financial services in leasing, fleet management, insurance, and mobility services. In 2017, it employed 289.321 people with a revenue of €164.330 billion.[94] Daimler AG is historically structured into five business units:

Mercedes-Benz cars, Daimler buses, Daimler trucks, Mercedes-Benz vans, and Daimler financial services. Each has their own divisional board and management team. Daimler AG brands include Mercedes-Benz, Mercedes-AMG, Smart Automobile, Detroit Diesel, and Freightliner. Daimler is seen as one of the most 'serious' automakers who are investing in and producing electric cars.[95] The company is going through a major restructuring programme called Leadership 2020[96] where they are seeking to become a more agile company using the principles of swarm intelligence. On July 9, 2016, Daimler CEO, Dieter Zetsche, announced in an interview for *Frankfurter Allgemeine Zeitung newspaper,* 'We imagine that in the short term, within half a year or a year, we will convert about 20 percent of our employees to a swarm organization.'[97] In an interview for *Wirtschaftswoche* (Handelsblatt Global) the same month Dieter Zetsche discussed the swarm organisation approach where he remarks, 'it isn't the decision-making pyramid that is of primary importance, but rather the network.'[98]

Their website contains an interview with employee Michael Poerner who is responsible for global organisational development at Daimler who tells the story of the journey Daimler has made towards becoming a swarm organisation. He says, 'What I liked most [about agile working in a swarm] was the speed and the flexibility. We did have a rough concept of phases and milestones, but we revised it every week. Spontaneous changes, such as those made by the customers, could be quickly integrated into our schedule. Of course this also means that it's harder to predict what's going to happen in the weeks ahead.' He concludes the interview by saying, 'We think that in the swarm we've developed something that we could not have developed this quickly or at this level of quality in any other way. Thanks to the mix of experts across business units and our flexible methods, we've begun a tremendous transfer of knowledge.'[99]

Lab1886 is a good working example of a swarm network within Daimler. They have adopted a three-phase approach towards innovation: ideation, incubation, and commercialisation. In the ideation phase, ideas are submitted and a system of crowd-voting, funding, and pitching are used to select ideas. In the second phase, the idea is further developed and tested to the market-ready stage. The final phase is rollout.[100] The innovative swarm mindset of the enterprise allows Daimler to have joint ventures and mergers with competitors. Recently they announced a joint-venture with BMW on their car-sharing operations to compete with Uber Technologies, Inc.[101] They have also invested €25 million euros in Volocopter,[102] a German-designed vertical take-off and landing (VTOL) electric air taxi service.

Company Profile 2: Typeform

Typeform is an online form and survey provider based in Barcelona. This tech company was founded in 2012 by Robert Mufloz and David Okuniev. Clients include Uber, Airbnb, Nike Inc., and Apple Inc. Recurring revenue in 2015 was hitting $160,000 a month[103] and it is listed as having between 51 and 200 employees.[104] The Typeform blog has an insider story[105] of how this early-stage venture went from being a flat organisation to a swarm organisation. Inspired by the organisational structure of Swedish entertainment company Spotify Technology SA. Typeform created cross-functional teams, called swarms, and established collaborative networks with designers and users. Their collaboration approach has four colonies (stages): create, collect, connect, and conclude. Typeform characterise their organisation structure and place of work as a hive.

Fostering Leadership Through Organisational Structure and Design

All of this, of course, has an implication for leadership and leadership development, the subject of this study. This chapter has outlined three core organisational structure and design groups (as depicted in Fig. 4.2). Centralised structures tend to be a breeding ground for positional power and authority where the leader is the key innovator and decision-maker, resulting in ego-based leadership. Decentralised structures (the hybrid model where decision-making is devolved to units and product lines in order to make local decisions) still relies on an influence-based approach where leaders build shared vision and commitment. Mindset training tends to be focused on such

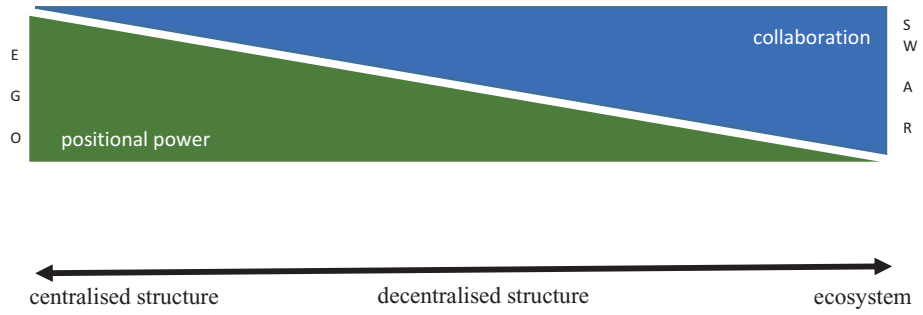


Fig. 4.2 The shift from positional power to collaboration within organisational structures

things as personal mastery, engagement, and influence. The challenge with this hybrid structure is that decentralised systems still have tenacious legacies of operant conditioning such as end year appraisals, performance-related bonuses, disciplinary procedures, and the like, which pulls the leader back towards status and positional power. This has created a generation of inauthentic scripted leaders who tend to default to ego behaviour when under pressure. Ecosystems resist centralised authority and decision-making, and innovation is distributed across networked communities. This is a highly collaborative system where leadership evolves within the collaborative swarm. The challenge associated with this kind of leadership is normally to do with the length of time it takes to arrive at collective decisions. This is where modern data-ism and machine intelligence supports ecosystems. This is the topic of the next chapter.

Human behaviour under closed egosystems is very different from human behaviour under open ecosystems and as we shift further into a more complex and volatile world the traditional ego-leadership characteristics of power, position, authority, and control will no longer be appropriate in the new networked order. Leaders need to be connectors within collaborative networks. Rigid structures need to be dismantled to make way for a more collaborative/swarm-like approach to innovation and decision-making, and leaders need to be more responsive and agile. John Chambers, former executive chairman and CEO of Cisco Systems, said back in 2009, 'From a business model and leadership perspective, we're seeing a massive shift from management by command-and-control to management by collaboration and teamwork … You could almost say this shift is as revolutionary as the assembly line.'[106]

Having looked at the first system of leadership development, the shift from egosystems to ecosystems, let's turn our attention now to the second leadership system—leading through networks.

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5

Leadership Development and Connections—From Leading Through Structures to Leading Through Networks

At the première of the 'Disneyland' television show on October 27, 1954, Walt Disney famously remarked, 'I only hope that we never lose sight of one thing—that it was all started by a mouse'. Mickey Mouse has frequently topped lists of highest earning fictional characters, was nominated ten times for an academy award winning best animated short film for *Lend a Paw* in 1942, was the first cartoon character to have a star on the walk of fame on Hollywood Boulevard, and is still a cardinal icon of the Walt Disney brand which, as we saw in the case study in Chap. 4, was valued at 55.14 billion in 2017. Mickey Mouse's creator is listed on most public records as 'Walt Disney' and there are famous pictures of Walt sitting alone with a pad sketching Mickey. The official Walt Disney family website reports that the idea for Mickey Mouse came to Walt on a train ride from Manhattan to Hollywood.[1] The story of Walt Disney and Mickey Mouse makes great reading; the only problem is it isn't true. The creation of Mickey Mouse came about through a collaborated process—indeed, popular rumours suggest Walt Disney didn't even know how to draw Mickey.[2] Walt Disney had sold the rights of his popular creation, Oswald the Lucky Rabbit, to Charles Mintz of Universal Studios and he needed another cartoon character. It seems, therefore, the Walt Disney story started with a rabbit and a shoddy business deal, not with a squeaky mouse. In 1928, Walt Disney started again from scratch and asked his only staff animator, Ub Iwerks, to sketch some character ideas. Ub was inspired by some drawings of mice that animator Hugh Harman had sketched and he drew a mouse using circular designs. Walt liked it and called him Mortimer. The story goes that Walt's wife, Lillian, convinced him to rename

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the character Mickey.[3] In 1938, animator Fred Moore redesigned Mickey into the familiar pear-shaped mouse we all know today.

Mickey Mouse was a collaborative venture. Collaboration is the way that most of the great ideas have materialised. Einstein collaborated with his former classmate Marcel Grossmann on principles of geometry and his 'sounding board' friend, Michele Besso, at the Federal Polytechnic Institute at Zurich (ETH) to shape his theories of general relativity.[4] The great modern inventions of the telegraph, telephone, light bulb, the movie projector, and the television, all inventions associated with single inventors, in fact came about through collaborative effort.[5] The idea of the lone genius is a myth. It is perpetuated by such award ceremonies as the Nobel Prize and makes for great biopics. The reality is that it is the connections around us that make a difference and help produce great ideas.

Leaders are at the nexus of ideas and decision-making and are shaped by these connections. The idea that leaders learn only in formal leadership programmes and settings is as inane as the idea that they are isolated geniuses. Andrea Derler said in a recent webinar that 'leaders actually learn most effectively by connecting with and learning from others—exposure to peers and colleagues, but also client feedback, new contexts, and social networks turns out to be the most impactful way to develop leadership capability.'[6] History shows us that organisational leaders who fail to collaborate, such as the leadership team in the story of Kodak Eastman from Chap. 4, can drive the enterprise to the wall. As Chap. 3 revealed, we select, develop, and revere our leaders as charismatic superheroes when, in fact, leaders are shaped by their environment and followers rather than leadership programmes that teach charisma and how to influence people. Leaders exist and are influenced by the connected systems in which they lead.

Connections, of course, can also have negative impacts where leaders look to their followers to endorse their ideas. Followers, ever hungry for good performance reviews, recognition, promotions, salary increases, interesting assignments, and the like, can collude with leaders through sycophancy and boss pleasing.[7]

This chapter explores the nature of networks and how to cultivate them effectively over time in order to grow organisational opportunities, connections, learning, and leadership.

The Nature of Networks

Networks are the 'central nervous system' of an organisation.[8] Quite simply, a network is a set of relationships that have nodes (person group or object) and ties (a connection).[9] Lego Foundation Research says networks are 'an

important tool to connect people spanning disciplinary areas, cultures, geographic locations and time zones. They provide a platform upon which new collaborations can take place, with the aim of stimulating innovation processes, and creating breakthroughs in the topic of interest'.[10] Interest in networks has grown incrementally with the growth of the internet and social media where technology is enabling us to reach a far greater proportion of people based on common interest and profile. The study of social networks—more formally known as Social Network Analysis (SNA) where the network is mapped and measured and roles, groupings, relationships, and information flows are identified—precedes the internet and includes early SNA researchers such as John Barnes, Anatol Rapoport, Paul Baran Stanley Milgram, Mark Granovetter, and Edward Laumann.[11]

Social scientists such as Paul Baran and Charles Kadushin[12] have historically grouped networks into three categories—ego-centric, social-centric, and open-systems (Fig. 5.1).[13]

Centralised Networks

The centralised (traditional) network, sometimes known as the 'hub and spoke' system, from a bicycle wheel, is an organisationally prescribed network which reinforces ego and positional power. Daniel McCallam's organisational chart for the Erie Railway company, a Northeast transport distributor, dates to the mid-1800s and is a classic hub and spoke network with a central leadership nucleus and branches of subordinates.[14] The problem with centralised networks is that they are dominated by one or two central nodes—typically the hierarchical leader. If these nodes are overloaded or inactive, it can result in bottlenecks, fragmentation, and system failures. Moreover, these powerful hubs condition and control organisational behaviour and cultures and can make or break reputations and reinforce collusional followership and positional power.

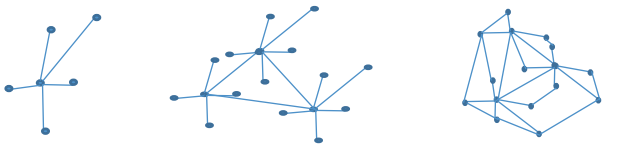


Fig. 5.1 Three types of networks

Decentralised Networks

Decentralised networks are more social-centric and relational. In "Knowing what we know: Supporting knowledge creation and sharing in social networks", Robert Cross et al. tease out the power and effectiveness of social-centric and informal networks above more centralised and functional models by analysing the relationship between players in a formal hierarchical network versus the same players in a more social-centric and informal network (Fig. 5.2).[15]

Jones is the Senior Vice President. Cole is low down in the hierarchy working in a divisional business unit; and yet, in an SNA, it is Cole who has more influence among informal networks. Cole is a key connector who spans boundaries and creates knowledge and information flow, rather than Jones who is on the social network periphery. Savvy people in this network would instinctively know that if there is a problem or bottleneck in the system, Cole is the go-to person.[16] In social-centric networks, it is meaningful connections and the ability to cross organisational boundaries that determines effectiveness and creates organisational flow.

The network 'connector', a term popularised by Malcolm Gladwell in *The Tipping Point*, is key to social-centric and open networks. Gladwell views connectors as the 'social glue' of networks in the context of three types of network roles:

> Mavens are data banks. They provide the message. Connectors are social glue: they spread it. But there is also a select group of people—Salesmen—with the skills to persuade us when we are unconvinced of what we are hearing.[17]

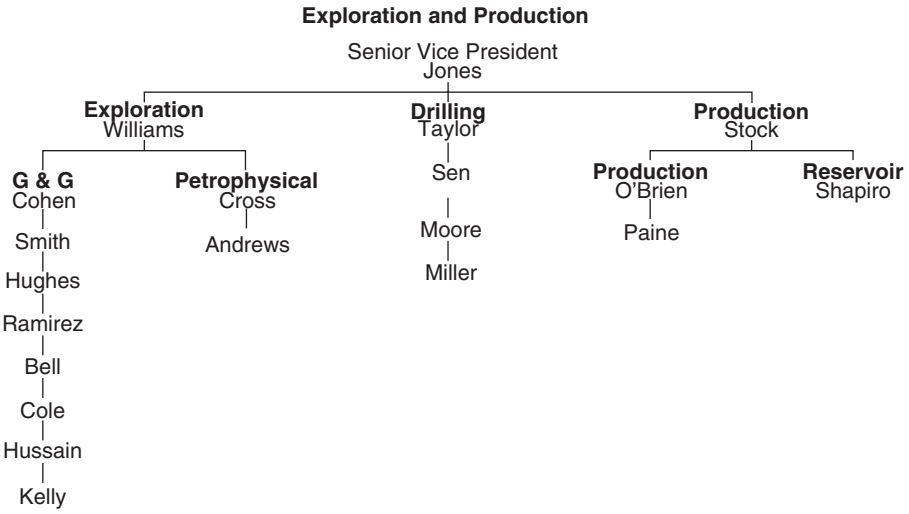
Malcolm Gladwell opines that connectors are people who get things done through others via building trusting relationships and 'gluing' connections together.[18]

Distributed Networks

Open networks/ecosystems are much more fluid, self-organising, and emergent, with a distributiveness that spans across multiple hubs and connectors, both inside and outside organisational boundaries. As a general rule, the more open the network, the more opportunity for collective impact, innovative ideas, and collaborative learning.

Creating digital connections across the organisation allows people to work around hierarchal structures and shorten the time it takes to get things done.

Formal Organizational Structure of Exploration and Production and Division



Informal Organisational Structure of Exploration and Production Division

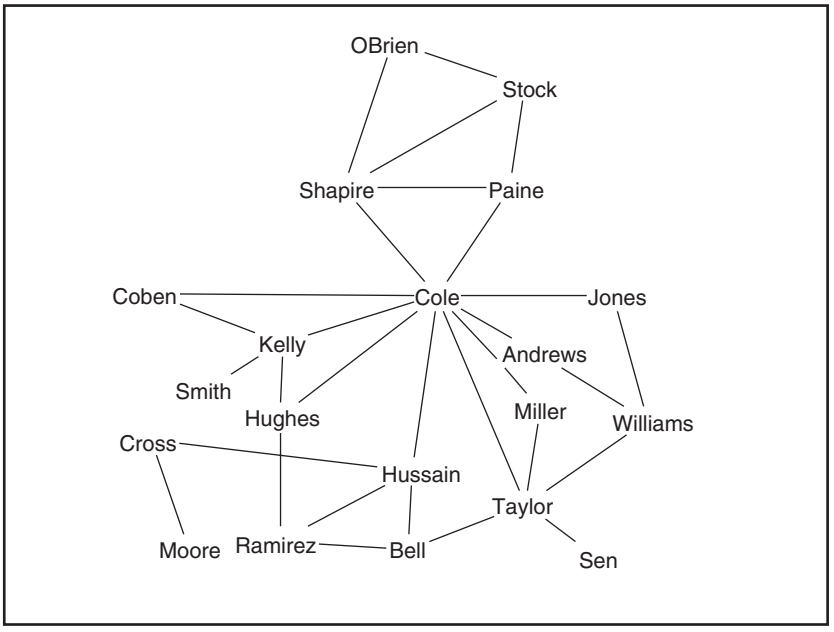


Fig. 5.2 Formal versus informal organisational structures. (Originally printed in Cross, R., Parker, A., Prusak, L. and Borgatti, Stephen P., 2009. "Knowing what we know: Supporting knowledge creation and sharing it in social networks" *Organizational Dynamics*. 30.2: 100–120.)

It also allows employees to share important information, find answers quickly, and get support from trusted advisors. Organisations of the future will need to develop open, distributed networks inside and outside the organisation if they are to displace positional power[19] and survive in the hyperconnected world.

The inspiration for open, collective, evolving, self-organising, collaborative networks can be found in the natural world.

Seven miles off the Maine/New Hampshire coastline sits Appledore Island. It is home to a dedicated group of researchers headed by Professor Thomas Seeley. For 40 years, Seeley, a neurobiologist and behaviourist, has been studying honey bees and their hiving habits. The reason why this small, isolated, and treeless island is a preferred location is because it makes an ideal site for controlled experiments with bees using wooden nest boxes.

There is an occurrence in nature where honey bees swarm suddenly to a new location. This seemingly spontaneous activity has been studied by Professor Seeley who has discovered that a great deal of collective decision-making and networking goes into this migration. Seeley positioned two wooden boxes at different ends of the island. One of the boxes (painted yellow) made an ideal nest, because it was roomy with a small entrance to deter predators; the other box (painted blue) was smaller with a bigger entrance. Scout bees discover the two potential sites. The bees that go to the yellow box are dabbed with yellow paint and the bees that go to the blue box are dabbed with blue paint. What follows is extraordinary. Scout bees return to the nest and communicate their discoveries using a figure-eight dance known as the 'waggle dance'—a term coined by Nobel laureate Karl von Frisch.[20] The scout bees literally point their heads in the direction of the new potential nest. More scouts go to the two locations to inspect them and are also dabbed with yellow or blue paint. The filmed experiment[21] shows the yellow bees being more expressive and doing more waggle dancing than the blue bees. Seeley explains that the bees are recruiting supporters for the more ideal location and since the yellow bees are waggling more, they pick up more recruits/support. More intriguingly, the yellow bees ram the blue bees to stop them from waggling; they act a bit like Gladwell's salesman. As soon as there is consensus, the entire colony of blue and yellow bees instantaneously swarm to their new home. According to Peter Miller, the bees' system mirrors the stock market, 'in which the value of a security rises or falls according to the collective judgement of the group.'[22]

The swarms' decision is not exercised though central decision-making but through distributed authority—pulsetaking, recruiting ideas, self-organising, voting on best solutions, and swarming to the new location. This has powerful lessons for organisations of the future where ideas and decisions will not be

channelled through ego-leaders, but through collaborative networks of self-organising agents making shared decisions and contributions.

Collaborative networks (Peter Gloor calls them collaborative innovation networks[23]) precede the internet. Groups of like-minded individuals throughout history have formed an open and collaborative physical network to co-create ideas. The Web has merely improved and accelerated this process and made collaborative networking more accessible and practical.

The concept of open/collective innovation is steadily being applied to business and there are an increasing amount of studies of companies that have benefitted from collaborative networks. Open innovation is a term first coined by Henry Chesbrough,[24] where companies look externally for research and development of their product/services using digital platforms and tools. Open innovation started in tech companies but has since expanded to other sectors.[25]

Examples of Open Innovation

Case 1—*My Starbucks Idea* Starbucks was an early adopter of collaborative networks. In 2008, Starbucks launched *My Starbucks Idea* which is a crowd-sourcing platform for innovation. The initiative is still going strong with ideas running into the 100,000s with over 300 ideas being implemented. The principle of *My Starbucks Idea* is to 'Share. Vote, Discuss'. Here customers interact with each other, and Starbuck employees share, vote, and discuss brand-based ideas that relate to the coffee chain.[26]

Case 2—Lab1886 As we saw in Chap. 4, Daimler AG is transforming its business using collaborative networks. Lab1886, a swarm network, includes an ideation phase where ideas are submitted and a system of pitching and crowd-voting (via an internal crowd sourcing platform) takes place. Funding and development is negotiated in a Shark Tank environment.[27] Success at this stage progresses the idea onto the incubation and commercialisation phases.

Case 3—Procter and Gamble The US consumer goods company, Procter and Gamble, P&G, has a long track record in collaboration. The company has three main business units: beauty care, household care, and health and well-being, and popular brands such as Pampers, Pringles, Tide, and Crest. Its net sales in 2017 reached $65.1 billion with a net income of $15.7 billion.[28] P&G invests 3.4% of revenue on innovation[29] and in 2015 35% of its new products originated in some form or other from outside P&G.[30] The company has

invested in digital and technological enablement.[31] A big part of this achievement comes from its highly successful portal to the outside world, Connect + Develop, where innovators can submit their ideas and become collaborative partners with P&G.[32]

Many other companies are working in this space including Lufthansa[33] and Del EMC.[34]

Practical Considerations and Principles for Building Collaborative Networks

Building collaborative networks isn't simply a question of changing the organisational chart—you need to design for collaboration.[35] Collaborate networks thrive in open ecosystems, and organisations need to understand they will not create collaborative networking if they persist with closed, centralised, and formal structures—they need to break down hierarchies and conditioning.

Once the infrastructure is in place, there are some core characteristics and design principles, inspired by the migration of honey bees, one needs to take into account when building collaborative networks.[36]

1. Diversity

Lesson one from the honey bees is that when creating these collaborative systems, it is important to cultivate a diversity of knowledge, ideas, and approaches from a wide cross section that spans organisational boundaries. Different perspectives, backgrounds, and cultures create innovative ideas and are the heartbeat of open innovation. Open collaboration extends beyond organisational parameters to include external networks such as consumers (as in the example of the *My Starbucks Idea* network), partners, and even competitors.

In his HBR article, 'Collaboration is the New Competition', Ben Hecht explores the importance of collective input from external sources:

> Leaders and organizations are acknowledging that even their best individual efforts can't stack up against today's complex and interconnected problems. They are putting aside self-interests and collaborating to build a new civic infrastructure to advance their shared objectives. It's called collective impact and it's a growing trend across the country.[37]

The automobile industry is benefitting from such competitor networks. Volkswagen launched a business platform 'One' in 2017 which has over 300,000 users and 40,000 partnerships linking business units from the VW group with suppliers.[38] A major business-to-business internet marketplace, the *Covisint Automative Internet Marketplace* was founded in February 2000 with GM, Ford, and Daimler DG and since joined by Nissan, Renault, and PSA/Peugeot-Citroen as minority equity partners. These diverse networks increase understanding and learning among traditionally competitive companies. Such strategic alliances are not just 'deals' or 'exchanges'; they are, in the words of sociologist and change management guru Rosabeth Moss-Kanter, a 'dense web of interpersonal connections and internal infrastructures that enhance learning'.[39]

2. Friendly Competition of Ideas

The second lesson from honeybees is that they are collaborative networks that thrive and buzz with friendly competitive ideas. The honeybees do not discourage differing points of view because they have a mechanism to filter these ideas. The problem with organisations that are rigorously defined by job titles, divisions, and departments is that groupthink and conditioned thinking can set in. If you have a department meeting where everyone is trained in the same discipline, you are most likely to get conditioned views. Sometimes it needs an outlier who can stimulate fresh perspective. These marginal ideas, outside of the collective group, are the gem of collaborative networks. Frans Johansson calls this the Medici effect (named after the fourteenth-century Italian Medici dynasty that supported a diverse number of artists that led to the Renaissance) where collaborators and solvers outside of the discipline can break conditioned thinking by having 'intersectional ideas'[40] which is a cross-functional environment where different fields, disciplines, and cultures intersect to produce diverse thinking and results.

A good example of the Medici effect was the British code breaking operation at Bletchley Park in Buckinghamshire, UK, during World War 2. The German encryption machine Enigma was deemed to be unbreakable. Traditionally, codes were cracked by experienced cryptologists. At Bletchley Park, people were hired from multiple fields and disciplines that included mathematicians, chess players, historians, computing engineers, scientists, topologists, puzzle solvers, and poets. This multidisciplined and intersectional approach created a Medici effect where the Enigma code was cracked using a variety of non-traditional cryptologic methods. Historians argue that the war was shortened by several years as a result of the work carried out in

Block D, Bletchley Park. Interestingly, it was also international collaboration that led to the solving of the Enigma code because Polish mathematicians had worked out how to read Enigma messages and they shared this information with their British counterparts.

In centralised structures, you have a group of resources selected for their experience and subject matter expertise who work in strictly defined roles and silos with very little cross-business sharing (indeed, sometimes units compete with each other). Friendly competition is based on mutual respect and trust. Trust, as Karen Stephenson remarks, 'is the glue that makes knowledge whole by holding human networks together.'[41]

3. Mechanisms to Narrow Choices

Honey bees use the waggle dance as a means to filter ideas and achieve consensus. Narrowing choices and arriving at group consensus has been a main characteristic of traditional collaborative networks throughout time; indeed, Aristotle alludes to it in *Politics* when discussing practical wisdom (phronêsis):

> For it is possible that the many, though not individually good men, yet when they come together may be better, not individually but collectively, than those who are so, just as public dinners to which many contribute are better than those supplied at one man's cost; for where there are many, each individual, it may be argued, has some portion of virtue and wisdom, and when they have come together, just as the multitude becomes a single man with many feet and many hands and many senses, so also it becomes one personality as regards the moral and intellectual faculties.[42]

Creating group consensus in pre-digital networks was a somewhat cumbersome task. It required a hierarchical and structured approach required clear visions and goals, an understanding of the rules of the game, high levels of organisation, and dedicated administrative time and effort to concentrate points of view.[43] The increasing uses of technology, such as data analytics and AI algorithms, has improved data gathering and filtering and has resulted in more efficient self-organising and virtual collaborative networks. This technological approach originates from the work carried out by Erik Lumer and Baldo Faieta where the study of ants' collective reaction inspired programmers to develop sets of algorithms that responded to its environment as rapidly as an ant colony.[44]

As collaborative networks have become digital and virtual, there has been an increase in the number of platforms and collaborative tools using AI

algorithms to collaborate and filter the data. These collaborative filtering and AI tools have been supporting large organisations for some time. Recently, however, there are a growing number of impressive commercial collaborative tools, ranging from internal communications/document sharing tools to project management/brainstorming tools, which are accessible to smaller companies and individuals and use the principles of dotocracy and crowd sourcing.[45]

I want to profile two specific commercial collaborative network tools that help clients co-create and use AI technology as a filtering and decision-making component.

Example 1: InnoCentive[46]
This design and innovation company is successfully using open innovation and collaborative networking systems to generate ideas for clients and companies. Challenges are presented to a 380,000-strong 'solver' network from over 200 countries who post solutions that are ranked by clients. InnoCentive's clients include governmental departments and private industry such as AstraZeneca,[47] Boehringer Ingelheim,[48] and General Fusion.[49]

Example 2: Unanimous AI[50]
This collaborative innovation company connects people by AI algorithms using principles of swarm intelligence by creating swarm platforms and human networks to make real-time decisions. The not-for-profit organisation XPrize, which designs and manages public competitions, used Unanimous AI swarm technology recently at their 2017 Visioneers Summit where 250 mentors collaborated together in formed swarms.[51]

These tools should not drive the solution. They are a practical way of harvesting and filtering the learning from the network, but the effort should always be on building an effective collaborative network. Let's take a look at that now.

Some Basic Principles for Building Collaborative Networks

One should start with the usual disclaimer—generic principles can never substitute a set of researched solutions tailored for individual organisations. The following six principles, however, capture some of the best practices for building online collaborative networks and should at least stimulate a few ideas.

1. *Plan and design for collaborative network groups*. Planning is crucial for building an effective online collaborative community; yet, most organisations are not designed for collaboration.[52] Online communities need to be designed with participants in mind. It is important to determine the community objectives and demography (the size, strength, range, density, and centrality). Furthermore, you need to understand how ideas and challenge will be initiated and how the network will be sustained and motivated. Anticipating the needs of potential participants is key—people participate in online communities because they want to get something out of it, so ensure the design is 'deeply aligned with the individual member's core interests'.[53]
2. *Keep it simple and focused*. The success factor of an effective network is high participation, collaboration, and innovative output. People need to be able to access the community easily, get what they want from it, and easily contribute. Choose the various platforms, themes, and technology with care. Once participants realise the strength of the network, they are more likely to contribute to it, which will make it a self-supporting and complex adaptive system.
3. *Ensure diverse participation*. The appropriate selection of members is crucial to the success and productivity of a network.[54] Invite multiple stakeholders to participate (customers, clients, vendors/suppliers, employees, analysts, and competitors). This diversity will ensure intersectional thinking along the lines of the Medici effect.[55]
4. *Shape the environment*. Algorithmic technology has allowed for bigger, virtual, and more open networks. It has also reduced the need for a highly managed network with rigorous rules, governance, and objectives. That said, there are still important things needed to shape the environment. Communicate the aims and objectives of the community, encourage participation, find the right moderation balance, bring the discussion to the key learning, reinforce community online etiquette and ethical code, promptly deal with individuals who violate the rules of engagement. Keeping things on topic needs to be designed from the start.
5. *Demonstrate the power of the network.* If strategy, policy, and organisational direction has been shaped by the network, then it is important to relay this back to the community so that they can see how their input and ideas have shaped direction. Never publically dismiss ideas and always acknowledge engagement and contribution. It is critically important for a collaborative network community to see the strategic importance of the network and the contribution they have made—make sure they never feel 'used' or exploited but are part of a vibrant co-creating experience.

6. *Give it time*. As Karen Stephenson has argued, the key to an effective network is trust.[56] Trust takes time and investment. Have trust in the 'network effect'—a phenomenon whereby a collaborative network becomes more valuable as more people use it.[57]

Towards Swarm Leadership

The coming of the fourth industrial revolution is changing all the rules and with it the core assumptions and definitions of leadership. Inspired by honey bees, leaders of the future will need to recognise that we live in a connected ecosystem where diverse agents and communities (including employees, suppliers, consumers, solvers, analysts, machine intelligence, and competitors) innovate together using collaborative tools and machine-organised intelligence. Future leaders will need to lead through these collaborative networks rather than through formal structures. Swarm leadership is the approach required to navigate in complex adaptive systems where decisions, direction, and innovation emerges from within the system itself rather than from ego selves.

The theoretical backbone of swarm leadership and collaborative networks is connectivism. We briefly explored connectivism in the introductory chapter. It is a useful and well-researched theory to apply to future organisations and leadership 4.0 because at its core is the idea that 'decisions are based on rapidly altering foundations' which are distributed across learning networks outside of ego selves.[58] In this connectivist model, the leader is no longer storing the information in order to process an individualistic point of view. Knowledge, agency, decision-making, and power are all distributed across the networked community. 'This amplification of learning, knowledge and understanding through the extension of a personal network', writes George Siemens, 'is the epitome of connectivism.'[59] Leadership emerges through the activity of the swarm. In *The Art and Science of the Knowledge-Based Organisation* by Steven Cavaleri and Sharon Seivert with Lee W. Lee, the authors liken this form of leadership to beekeeping:

> In many respects, knowledge leaders are like beekeepers. Beekeepers are always seeking ways to improve the quality of their bees' honey. There are many factors for beekeepers to consider: food sources for the bees, type of housing for the hives, climate and location of the hives. But the most important factor of all is for beekeepers to remember that their bees already know how to produce honey. Therefore the beekeeper must not disrupt the bees' natural processes. Otherwise there will be problems.[60]

This connectivist model helps redefine our appreciation and understanding of leadership. The effective leader of the future will not be ego-led, but networked-led; not a director but a connector. Listed below are five roles of the swarm leader:

- **Swarm leaders as system builders**[61]
  The network needs to be designed, initiated, and built. Leaders need to decentralise structures and initiate/cultivate ecosystems and will need to organise the cultural hive to encourage collaboration and the flow of ideas. Peter Gloor writes, 'The art [of leadership] is to select, grow, and nurture the right swarm.'[62]
- **Swarm leaders as choreographers**
- The term choreographer, borrowed from Jeffrey Shuman and Janice Twombly (2010), means to coordinate the network. The network doesn't need to be directed—it is a complex adaptive system where hubs, gatekeepers, pulsetakers, mavens, connectors, salesmen, boundary spanners, information brokers, and peripheral people all collaborate without direction—but it needs to be taken care of, nurtured, and grown. Like the queen bee, the role is not linked to authority or status—it is a functional role.
- **Swarm leaders as harvesters**
- Someone needs to ensure that the ideas and decisions that are generated from the collaborative network are progressed from ideation to a commercial footing.
- **Swarm leaders as digital communicators**
- Leaders need to be able to present the ideas flowing out of the network in a clear, transparent, compelling way that captures the thoughts, decisions, and innovation that come from the network. Here leaders will need to have certain skills in structuring and designing information and ideas[63] and to take advantage of new digital trends such as big data, infographs, and digital storytelling to convey the intersectional ideas.
- **Swarm leaders as connectors**
- Knowledge leaders need to be able to pollinate ideas and energy across the various 'learning fields'.[64] In Gladwell's terminology, they need to be connectors. Leaders need to interface with a broad community of agents including customers, non-biological systems, partners, employees, cloud workers, and competitors. This will require multiple intelligences and a digital and distributive mindset—a resource not a source of knowledge.

The ideas pursued in this chapter suggest a fundamentally different concept of leadership than the traditional ego leadership. Swarm leadership is not ego driven (fixated on influencing and leading decisions and processes); it is a responsive, connectivist leadership that nurtures and shapes the complex adaptive system to generate a collective view. As the world shifts to a highly connective and connected digital state, leaders of today and tomorrow need to embrace digital leadership and the digital trends of emergence, trending, crowdsourcing, strategy by discovery, rapid launch, and networked learning. The old structures, legacies, and pedagogies are not fit for purpose for a modern connected organisation.

The traditional educational content that we teach in classrooms and the way we teach it will need to change as we shift from a directive to a collective leadership. Let's turn out attention now to the final leadership development system, developing the mindset of leaders to understand and champion ecosystems, collaborative networks, and swarm intelligence.

Notes

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12. Baran, Paul, *On Distributed Communications* (Santa Monica, CA: Rand, 1964); Kadushin, Charles, *Understanding Social Networks: Concepts, Theories, and Findings* (New York: Oxford University Press, 2012).
13. Jon Husband and Valdis Krebs consider organisations composed of two types of networks: prescribed and emergent. Prescribed networks include the formal hierarchy, assigned project teams, and defined business processes. Valdis Krebs and Jon Husband, "Networks and Wirearchy," Workforce Solutions Review July 2015, accessed June 16, 2018, http://orgnet.com/WSR_July2015Krebs-Husband.pdf
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15. Rob Cross, Andrew Parker, Laurence Prusak, Stephen P. Borgatti, "Knowing what we know: Supporting knowledge creation and sharing in social networks", *Organizational Dynamics*, Vol. 30, No. 2, 100–120, 2001.
16. In Robert Cross' terminology, '*central connectors*, who have a disproportionate number of direct relations in the network and might be either unrecognized resources or bottlenecks … *boundary spanners*, who connect a department with other departments in the organization or with similar networks in other organizations. *Information brokers* communicate across subgroups of an informal network so that the group as a whole won't splinter into smaller, less-effective segments … *peripheral people*, who might either need help getting connected or need space to operate on the fringes.' Terms used in Cross, Robert L., Andrew Parker, *The Hidden Power of Social Networks: Understanding How Work Really Gets Done in Organizations* (Boston, MA: Harvard Business School Press, 2004).
17. Gladwell, Malcolm, *The Tipping Point: How Little Things Can Make a Big Difference* (Boston: Little, Brown, 2000) 70. Karen Stephenson identifies three central nodes or 'culture carriers'—the hub, the gatekeeper, and the pulsetaker. Karen Stephenson, "What Knowledge Tears Apart, Networks Make Whole", *Internal Communication Focus*, no. 36, 1998. Karen Stephenson talks of the links of her ideas with Malcolm Gladwell in this 2003 Q&A elearningpost interview, "Q&A with Professor Karen Stephenson", *elearningpost*, July 7, 2003, accessed June 16, 2018, http://www.elearningpost.com/articles/archives/qa_with_professor_karen_stephenson
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22. Miller, Peter. *Smart Swarm* (London: Collins, 2010) 38.
23. A CoIN is a cyberteam of self-motivated people with a collective vision, enabled by the Web to collaborate in achieving a common goal by sharing ideas, information, and work. Gloor, Peter A., *Swarm Creativity: Competitive Advantage through Collaborative Innovation Networks* (Oxford: Oxford University Press, 2006) 4. Peter Gloor distinguishes between collaborative innovation networks and collaborative learning and interest networks. Wikipedia, for example (a reference website providing open edited content

provided largely by anonymous volunteers who input and collaborate to build collective learning content), is a collaborate learning and interest network. A collaborative innovation network is a subset of collaborative learning and interest networks. Gloor, Peter A., *Swarm Leadership and the Collective Mind: Using Collaborative Innovation Networks to Build a Better Business* (Bingley, UK: Emerald Publishing, 2017), but has a distinct function where a small group with a collective vision and common goal can co-create directly with the customer Source: Jeffrey Shuman and Janice Twombly, "Collaborative Networks Are The Organization: An Innovation in Organization Design and Management," 1 January 2010, accessed June 16, 2018. http://journals.sagepub.com/doi/abs/10.1177/0256090920100101

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25. See, for example, Nesli Nazik Ozkan, "An Example of Open Innovation: P&G", *World Conference on Technology, Innovation and Entrepreneurship*. Procedia – Social and Behavioral Sciences 195. 1496–1502, 2015.
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6

Leadership Development and Mindsets—From Directive to Collective Behaviour

You may have heard the story that I'm about to tell. It is a traditional parable and has many variations. Let me tell you my version. A supervisor with a clipboard and a hard hat was walking through a busy building site. The supervisor walked up to a random worker and asked them what they were doing. 'I'm mixing plaster,' replied the worker. The supervisor nodded, made a note, and walked on. Next, the supervisor espied a worker on some scaffolding and hollered up to them to explain what they were doing. 'I'm laying bricks,' the worker shouted back. The supervisor gave a thumbs up, made a note, and walked on. 'Hey you!' exclaimed the supervisor to a worker that was passing by pushing a wheelbarrow. 'What are you doing?' The worker stopped and eased the wheelbarrow down and looked at the young supervisor clutching a clipboard. 'Me?' responded the worker thoughtfully, 'I'm building a cathedral.'[1] The final worker was thinking collectively and describing their work in the context of the broader system. We often become so task-focused, that we can miss what is going on around us and the role we play in the collective whole. Typically, as we have seen, the organisation induces this mindset through structures and processes. That young supervisor could quite feasibly have been Frederick Winslow Taylor, documenting workers' tasks to create conditioned and standardised working practices and routines. The effective leadership mindset in IR4 will be the cathedral builder and not the bricklayer. Collaborative and collective sensemakers will thrive in the future, not individual task-focused and categorised thinkers.

This final chapter on developing a holistic/systems approach to leadership development explores how future leaders will need to focus on a different kind of cognitive mindset—a collective cognition that relates to a digital

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world informed by sensemaking, data-ism, collective intuition, multiple intelligences (MIs), and cognitive readiness. It presents guiding principles, frameworks, content, and methodologies for developing leadership mindsets in the hyperconnected business environment of Industry 4.0 where leadership will be filtered through ecosystems and swarms of collaborative networks.

Below are four cognitive mindset shifts that future leaders need to adopt in order to be more responsive and adaptive in a volatile, uncertain, complex, and ambiguous world. These mindsets—and the practical content associated with them—will assuredly make up educational content in future leadership development interventions.

From Decision-Making to Sensemaking

In the classic 1965 American war movie, the *Battle of the Bulge*, an American Intelligence Officer, Lt. Col. Dan Kiley, played by Henry Fonda, is a sensemaker. He pieces together situations, evidence, and data on his reconnaissance missions and senses that that the Germans are planning an all-out offensive to reseize French territory and take the port of Antwerp. His company superiors and decision-makers dismiss his theories as 'crackpot hunches' because they do not fit with their fixed assumption that the Germans lack resources and manpower for such an offensive and they seek to relieve Lt. Col. Kiley from duty. The Germans do indeed launch a major offensive and Lt. Col. Kiley is vindicated.

Sensemaking has a rich historical background. There are different streams of sensemaking including organisational sensemaking,[2] communication and information systems,[3] human-computer interaction,[4] and military application,[5] all of which vary in their definition of sensemaking. It is a widely used term that is often misunderstood.[6] Weick and Sutcliffe capture the spirit of sensemaking when they say, 'Sensemaking is not about truth and getting it right. Instead, it is about continued redrafting of an emerging story so that it becomes more comprehensive, incorporates more of the observed data, and is more resilient in the face of criticism.'[7] Sensemaking differs from classic forms of decision-making where human agents engage in rational choice.[8] Sensemaking, based on abductive logic, recognises cognitive limitations such as filtering and fixed mental models and approaches ideas without preconceived reality, status, personality, or a temptation to solve things or wrap thing up in one 'true picture'.[9] Moreover, it embraces situational awareness[10] and takes in data from a wide range of sources. In essence, sensemaking is a contextual theory which is more about mapping

experiences and verifying/updating the map.[11] This notion of continued redrafting, filtering, metacognition,[12] and challenging assumptions and self-perceptions (and assumptions and perceptions of others) will be a critical quality in leadership 4.0.

Practical Ways to Enhance Sensemaking

Reclaiming Old Models

Marcel Proust once said, 'The real voyage of discovery consists not in seeing new sights, but in looking with new eyes.'[13] There is a classic suite of perception models that have been commandeered in the past by leadership programme designers as tools to help leaders build engagement, empathy, and influence. It is time to reclaim these perception models to enhance sensemaking. The models are listed below.

1. Mental Models

Chris Argyris describes the way we perceive and see the world, our fixed mindset, as 'mental models'.[14] Senge defines mental models as 'deeply engrained assumptions, generalizations or even pictures or images that influence how we understand the world and how we take action.'[15] Mental models drive habits and behaviours (oftentimes without us even knowing it). Our mental models are based on experience, culture, and upbringing. By stepping back and suspending these mental models, we can 'see things with new eyes'.[16]

2. Ladder of Inference

Devised by Chris Argyris,[17] this tool explores the steps we take from observing to taking action. Argyris invites us to imagine a ladder where at the bottom rung is observable data and the top rung is the action we take. All the rungs in between represent inference (the selection, meanings, assumptions, conclusions, and beliefs we make to arrive at actions). Very often we act on assumption rather than on data. The ladder of inference is a self-awareness tool which helps us check our inferences and to coach others and ourselves using the ladder as a way to suspend assumptions and act on observable data.

3. Frame Reflection

Frame reflection, a term coined by Donald A. Schön,[18] is essentially a process of forcing yourself to look at alternative scenarios or to see situations from the point of view of somebody else. It requires us to consciously suspend our assumptions and see things through a different set of lens.

4. The Iceberg Model

The iceberg model, attributed to Daniel Kim,[19] based on the theory of mental models developed by Chris Argyris and Donald Schön[20] and also based on systems dynamics developed by Jay Forester, helps us to look beyond surface events to underlying patterns, structures and mental models—to see the bigger picture and the underlying causes. Imagine an iceberg where the tip (the event) is above the surface and the levels of causality lie beneath the waterline. Too readily, we see only the isolated event and fail to make sense of the things going on in the background. Disciplining ourselves to drill down to underlying causes helps to broaden our perspective and appreciate the underlying issues and interconnectedness of the whole system. Rick Ross has created a short yet effective technique entitled 'The Five Whys'[21] which helps us drill down the iceberg to reach underlying mental models.

5. Scenario Planning

Scenario planning has been used successfully in government and large organisations such as Royal Dutch Shell, Disney, Accenture, and Motorola. It is a structured story format that hypothesises future projected scenarios and the impact they will have on current organisational reality. Imagining possible scenarios and putting provisional planning in place can help the organisation get into a sensemaking mindset.

These classic perception tools have been employed in leadership 3.0 as cognitive-dependent tools to manage and influence relationships, direct strategy, and enable decisions. In the context of influencing, they are all about managing 'truth' and certainty. In the context of sensemaking, however, these tools help leaders suspend truth and certainty and open up multiple possibilities and approaches. This creates cognitive readiness that prepares the leader for a world of uncertainty and volatility.

Cynefin Framework

The Cynefin framework (pronounced Kuh-NEV-im/ˈkʌnɨvɪn from the Welsh word signifying habitat or place of multiple belongings[22]) was created in 1999 by Dave Snowden when he worked for IBM Global Services. This sensemaking framework helps sensemakers understand the level of complexity of a given situation in order to select the right interventionist strategy (Fig. 6.1).

It has four domains spread on a continuum from order to disorder.[23] The four domains are:

- *Simple*—as in the game of tic-tac-toe (noughts and crosses) where there is a clear and predictable cause and effect. The strategic approach (aided by best practice) is to Sense/Categorise/Respond.
- *Complicated*—as in the game of chess where the relationship between cause and effect is less predictable and requires expert analysis. The strategic approach (aided by good practice) is to Sense/Analyse/Respond.
- *Complex*—as in the game of poker where the relationship between cause and effect is understood retrospectively. The skill in poker is to pay attention to the sequence of cards and make calculated predictions. The strategic approach (aided by emergent practice) is to Probe/Sense/Respond (where probe means to discover and learn).



Fig. 6.1 Cynefin framework. (Reprinted with permission from Dave Snowden, Cognitive Edge)

- *Chaotic*—as in the game 'blind man buff' where there is no relationship between cause and effect, only chaos. The blindfolded player needs to tag sighted players who are provoking them. The strategic approach (aided by novel practice) is to Act/Sense/Respond (where act means to stabilise the crisis).
- *Disorder*—this is not so much a domain as a state of paralysis where people do not know the degrees of causality or complexity and simply revert to a habitual (default) reaction.

Originally an IBM strategic tool for policymaking and product development, Cynefin has since been used in government, military and healthcare sectors, and is an excellent framework for appreciating and managing uncertainty in knowledge-based environments.

Case Study: Agile Software Development

Agile Software Development approaches software development via a self-organising and cross-functional collaborative network of software practitioners. It was originally formed in 2001 by twelve software collaborators at a resort in Utah to tackle the problems of late and over budget projects in the software development industry.[24] Agile collaborative frameworks include 'Scrum' which is an iterative and incremental framework for managing product development where teams swarm behind evolving ideas to reach a common goal, and 'kanban' (Japanese for visual signal or card) which is a visual workflow management tool. In 2011, Agile Software Development started to employ the Cynefin framework to map ideas and challenges and allocate resources. This ECO study highlights the merits of the model—'Only with the publication of Dave Snowden's papers on the Cynefin model did a system emerge that finally allowed researchers and practitioners to understand social complexity science, and its position as the theoretical basis of software Agility.'[25]

The Cynefin framework is a common framework that identifies the complexities of a given challenge and aids collaboration. Sometimes we overcomplicate issues and ideas that really are quite simple (we see patterns that do not exist); other times, we simplify highly complex situations (applying causality to a random/chaotic chain of events). We can also suffer from cognitive bias where we view the challenge through entrenched mental models. The Cynefin framework, a model for understanding thought processes,

allows agents to identify the degree of complexity so that they can give the right amount of energy and collective thinking to the challenge. Issues that are identified as simple need a straightforward sense/categorise/respond; issues that are more complex need group analysis and probing and, therefore, will need to be allotted more time and resources. The strength of the Cynefin framework is that unlike categorisation tools, such as four-box matrices, the data precedes the framework and it supports self-organising collaborative networks, allowing collaborative teams to allocate the right degree of time and effort to collective projects. The sensemaking framework is an excellent collective framework for agents to sense where they are in the continuum of complexity and to prioritise their time in order to maximise co-creativeness.

From Charismatic Authority to Swarm Intelligence

In Chap. 1 we considered charismatic and heroic leadership. Aristotle believed in naturally gifted leaders—charisma, you'll recall, is Greek for 'gift'. Weber provides a classic definition of charismatic authority in *The Theory of Social and Economic Organisation*:

> Charisma is a certain quality of an individual personality by virtue of which he is set apart from ordinary men and treated as endowed with supernatural, superhuman, or at least specifically exceptional powers or qualities. These as such are not accessible to the ordinary person, but are regarded as of divine origin or as exemplary, and on the basis of them the individual concerned is treated as a leader.[26]

This mindset of leader as an ego-driven superhero with superhuman powers, unique intuition, and intellect is a pervasive legacy. We recruit potential leaders from top flight universities and we develop them in residential retreats where we teach them personal mastery, decision-making, engagement, and influencing skills. What is more, if we really want to blow the training budget, we engage theatre specialists to teach basic theatre techniques to project charisma and authenticity. Then, of course, we spend more money on executive coaching and counselling sessions dealing with the fallout of executives who cannot cope with being corporate superheroes.

Leaders of the future do not need master classes in influence and charisma; they need to develop swarm intelligence. There is a team building challenge that is widely used in workshops around the world called 'The Magic Stick/Cane'. It is ideally for groups of 8–16. Participants are split in half and asked

to form two rows facing each other. They are instructed to extend their arms and index fingers. It is explained to the group that a light stick or cane will be placed on the bridge of their outstretched fingers and that the task is to lower the stick to the ground. The group are given simple instructions—that the top of their outstretched index fingers must remain in contact with the stick at all times, and that the stick must rest on their fingers, and that they cannot hook, pinch, or grab the stick in any manner. It sounds a simple task but in most cases, as soon as the stick is placed on the groups' outstretched fingers it sharply elevates, causing group incrimination. Only swarm intelligence can solve this task. The task fails when the group is not synchronised, when dominant members of the group lead or force the task, or when the rules are broken. Success occurs when the group acts collectively, self-organises, collaborates, communicates, coaches, is situationally aware, deals with emergent issues, acts ethically, and remains connected. This is swarm intelligence.

Eric Bonabeau et al. define swarm intelligence as the 'emergent collective intelligence of groups of simple agents.'[27] Swarm intelligence theory is the idea that flocks, swarms, schools, colonies, and humans behave more intelligently as a collective rather than as an individual species. In Pixar's *Finding Nemo*, the shoal of fish exercise collective thinking and action when they swim downwards against the fishing net to break the trawler's harness that supports the nets. Swarm intelligence covers a wide range of human and artificial intelligences including collective knowledge, collective intuition, collective thinking (what Louis Rosenberg calls the 'hive mind'),[28] collective vision, collective decision-making, and self-organising behaviour.

Practical Ways to Develop Swarm Intelligence

The most practical way that swarm intelligence can be developed has been directly explored in the two previous chapters. Organisations need to decentralise structures and create open ecosystems with an emphasis on self-organising collaborative networks—such is the environment that propagates collaborative swarms. Collaborative tools, profiled in the last chapter, are revolutionising the way organisations collaborate and make decisions, which is shifting the organisation away from decision-making via individual gut feel, which is a classic ego-driven leadership approach,[29] towards collective intuition, collaboration, and collective decision-making using AI technology.

Traditionally, any form of collective action is prefaced with a health warning that thinking, strategising, building shared vision, and decision-making in groups takes time and effort and can result in groupthink and bureaucracy. Technological advancements in data mining and artificial intelligence are making collective action and swarm intelligence more feasible and practical as the output of ideas and intuitions are digitally filtered. As Steve Lohr says, 'Decisions of all kinds will increasingly be made on data and analysis rather than on experience or intuition—more science and less gut feel.'[30] That said, there is a need for some formal education in building general mindsets around the benefits of working collectively and collaboratively.

Cultivating Multiple Intelligences

We have seen that future leaders and self-organising networks will need to be multifunctional and swarm intelligent. They need to interface between networked communities, humans, and machines; interpret symbols, scripts, and codes; sensemake and deal with ambiguity; probe, inquire, and think/act cybernetically. Key to swarm intelligence is cultivating multiple intelligences, a concept developed by Howard Gardner in his seminal text *Frames of Mind* and developed further in *Multiple Intelligences*.[31] Organisations tend to value people who use reason, deductivism, and logic. Effective leaders of the future will need to develop and expand MI. In recent times, organisations have begun to value emotional intelligence—popularised, of course, by Daniel Goleman.[32] These twin intelligences feature in Gardner's taxonomy of intelligence (logical-mathematical and interpersonal intelligence—the ability to read moods, temperaments, motivations, and intentions of others), but Gardener expands the range of intelligences to include linguistic-verbal ('word smart'), visual-spatial ('picture smart'), bodily-kinaesthetic ('body smart'), musical-rhythmic ('music smart') and intrapersonal ('self smart'). In his later book *Multiple Intelligences: New Horizons in Theory and Practice*,[33] Gardner adds two more intelligences, naturalist ('nature smart') and existential ('cosmic smart'). MI threads its way through all aspects of leadership 4.0 and organisations will need to diversify from teaching rational-based management towards an MI perspective. Swarm intelligence, swarm leadership, collective thinking, the hive mind, and human 'waggle dancing' are going to require a level of MI sophistication. The good news is that there are excellent MI self-assessment tools, based on Howard Gardner's work, available to help build MI awareness and strategies.

Collaborative Intelligence

The term collaborative intelligence (CQ), coined by William Isaacs,[34] relates to the ability to build, contribute, and manage the power and energy found in networks of people. Many research groups have focused on the power of collaboration.[35] We have seen in the previous two chapters that decentralised structures and collaborative networks encourage collaboration. We need to continue educating leaders on the benefits of collaboration, collective thinking, and swarm intelligence. This wheel of collaboration shows what can be achieved at an individual level to create a collaborative mindset (Fig. 6.2).

Preferences

Self-assessment is a good way to appreciate collaborative preferences and blind spots in others and ourselves. A popular psychometric tool for understanding how we interact in conflict situations is Thomas Kilman Conflict Mode Instrument.[36] This psychometric explores five basic preferences for

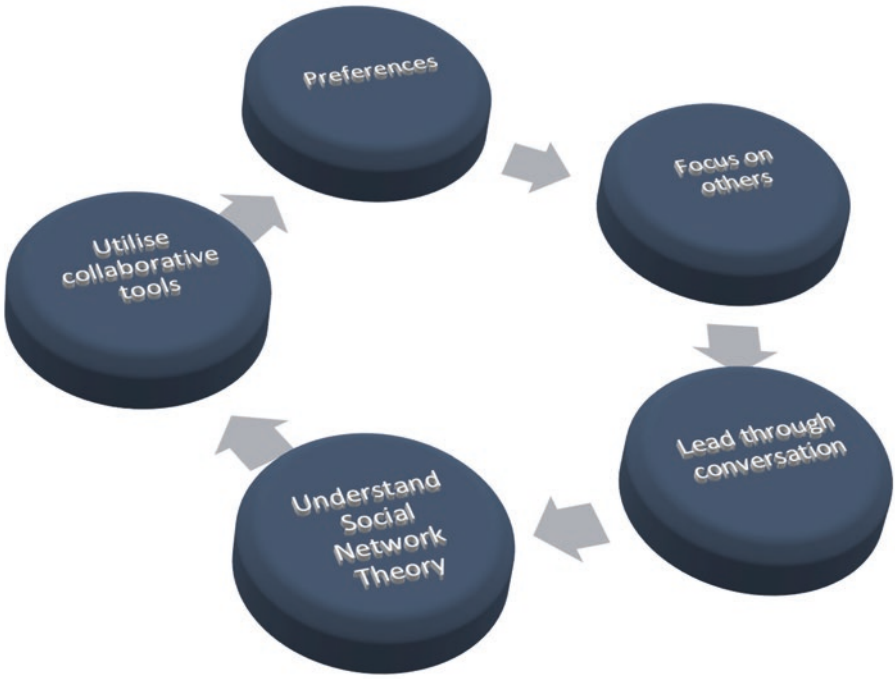


Fig. 6.2 The collaboration wheel

interacting with others—assertiveness, avoiding, accommodating, collaborating, and compromising.

Focus on Others

Typically, we tend to focus on our own contributions in conversations. We need to learn to focus more on others by suspending our egos and listening to other contributors. Sensemaking, MI, and active listening all contribute to building empathy. We also need to develop trust and empathy by adopting a learner not knower mindset[37] and learning to celebrate the enterprise, not the celebrity.[38]

Lead Through Conversation

To be an effective collaborator, you need to be able to lead through conversation.[39] We need to build collaborative dialogue through such tools as Paul Grice's Four Maxims[40] and *Balancing Advocacy and Inquiry*.[41]

Understand Social Network Theory

In Chap. 5 we looked at the various roles in a network such as Robert Cross' connectors, boundary spanners, and information brokers; Karen Stephenson's hub, gatekeeper, and pulsetaker; and Malcolm Gladwell's connectors, mavens, and salesmen.[42] Technical labels aside, it is important to know how you naturally network so that you can exploit your strengths, and develop strategies. It is also important to be able to identify the various networking preferences active in the system.

Utilise Collaboration Tools

We saw in the last chapter that there are many commercial tools on the market to support collaboration. An excellent *Computer World* article, 'How to pick the right collaboration tools', provides some recommendations on selecting the right collaborative software.[43] The article advocates not to get too fixated on the technology but find a tool that is fit for purpose.

Group Improvement (Kaizen)

Kaizen改善 is often mischaracterised as self-improvement. It is the Japanese word for continuous improvement or change for better and has a broad application for general systems improvement across all functions, employees, and supply chains. It has been applied in various industries but most notably in the production system at Toyota Industries Corporation. The Toyota Industries Report 2017 contains a special feature entitled "Kaizen (Improvement) Activities Across Diverse Business Domains" which talks about the spirit of kaizen being in Toyota Industries' DNA.[44] As Steven Spear's HBR article shows, Toyota has a culture where all employees are encouraged to experiment, and it also has a strong feedback and coaching culture where managers are seen as 'enablers'.[45] Developing a mindset of kaizen, therefore, would include being experimental—being open to trying new things without fear of failure—collaborating, and being receptive to coaching/feedback.

Kaizen and *Stages of Learning*

The *four stages of learning* is a classic study on learning motivation that is often wrongly attributed to Abraham Maslow. The model was first introduced by Martin Broadwell as "Four Stages for Learning Any New Skill".[46] The four stages include unconscious incompetence ('I don't know what I don't know'), which is where we have knowledge blind spots; conscious incompetence ('I know that I don't know') where we become aware of our blind spots; conscious competence ('I know that I know') where we are actively engaged in experimenting, learning, and self-improvement; and unconscious competence ('I already know …') where we shut ourselves off from experimentation and continuous learning.

Figure 6.3 demonstrates how kaizen occurs when we consciously experiment and explore possibilities rather than being stuck in ignorance, expert posturing, and routine thinking.

Feedback and Coaching

An effective way of developing kaizen is through coaching and feedback. Collaborative networks work best with just-in-time coaching and feedback. Modern digital tools can measure and monitor performance through online

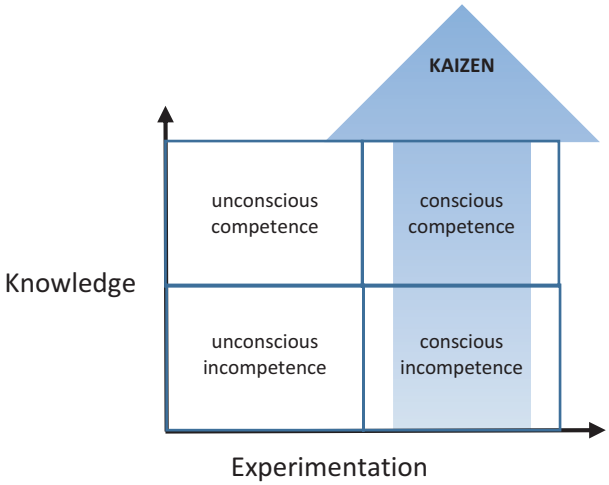


Fig. 6.3 Kaizen and the four stages of learning

metrics, efeedback, ecoaching, and ementoring where all online activity is fed into ongoing performance evaluations.

Dealing with Constant Change and Ambiguity

As the ancient Chinese proverb says, 'When the winds of change rage, some build walls, others build windmills'. We will need to prepare our leaders and communities to deal with ambiguity and change and create an adaptive and cognitive readiness culture and mindset. Below are some practical ways to become more confident in uncertain environments.

Self-Assessment

The change style indicator (CSI) is an excellent psychometric that helps individuals identity their preference for approaching change. The CSI covers three primary types of change attitudes: Conservers (who accept structure, prefer retaining systems, and resist sudden or rapid change), Pragmatists (who explore structure, mediate, and accept change if it serves a purpose), and Originators (who challenge structure, embrace ambiguity and uncertainty, and prefer rapid and radical change). Participants fill out a questionnaire and

are scored on a continuum between these three primary styles. Once again, self-assessments can help us identity our natural default style and help us develop other styles.[47]

Virtual Reality Games

The European School of Management and Technology (ESMT) Berlin business school is currently using virtual reality (VR) to teach leadership in a digital environment. Programme Director in the Executive Education Department, Benjamin Quaiser, recently profiled in the *Financial Times* says:

> [Digitisation] is a topic or theme in every class we teach because these executives all know that their businesses are being, or will be, disrupted by digital technology. But it's quite hard to talk about it without using technology. By immersing them in a virtual environment where they have to lead, collaborate and solve problems with each other, they experience how challenging it is to lead in a digital, VUCA [volatile, uncertain, complex and ambiguous] world.[48]

Dr. Quaiser shared with me his journey towards using VR technology in a leadership context. He explained that in a flagship ESMT programme, Leading Digital Transformation, that deals with the strategic, leadership, and technology background of digital transformation and digital leadership, participants were very clear about the strategic impact of digitalisation and the new technologies, but were somewhat 'fuzzy' about the impact of digitalisation on future leadership culture—the actual experiencing of leading in a volatile environment. Dr. Quaiser and his team collaborated with a local start-up, Exit VR, to develop a virtual game where participants are placed in an uncertain and volatile virtual environment and left to figure out various tasks and challenges. The game is debriefed to shed light on behaviours relating to leading in a volatile environment. The debrief also gives a chance for participants to revisit decisions and gain peer feedback. Participants recorded an 'intense' experience using VR and said it changed their thinking and behaviour. It gave them an experience of an actual volatile environment in the context of challenging technology that required new approaches in delegation, collaboration, and communication. In the future, Dr. Quaiser plans to customise the game to focus on specific leadership areas and for the game to be fully virtual and played in cross-cultural teams with virtual debriefs.

From Analogue to Digital Mindsets

People with analogue mindsets have a very different attitude to knowledge and data than someone with a digital mindset. The key differences are represented in Table 6.1.

There are already technological solutions to managing data such as powerful search engines, data analysis, big data analytics, data mining, prescriptive modelling, and the like, but a mindset shift is required to view data and information as an enabler rather than a source of competitive advantage, power, and control. A McKinsey study on digital quotient (DQ) puts digital thinking and mentality at the centre of future organisational change, 'A digital mind-set institutionalizes cross-functional collaboration, flattens hierarchies, and builds out environments to encourage the generation of new ideas.'[49]

Practical Ways to Develop Digital Quotient

Network Perspective

Leaders with a network perspective, argue Kristin Cullen et al. from *The Center for Creative Leadership*, 'understand the dynamic web of connections that have an impact on their work, their leadership, and the leadership culture of their organization. They can identify patterns of relationships and people in their personal network and the broader organizational network that will foster strategic success—and those that will inhibit or undermine it.'[50]

Table 6.1 The key differences between analogue and digital mindsets

Analogue mindset	Digital mindset
Data and information is stored and centralised	Data and information is shared and distributed
Data and information is processed sequentially (and slowly)	Data and information is processed multidimensionally (and rapidly)
Data and information originates from the lone genius	Data and information emerges from collective thinking
Data and information passes along the value chain	Data and information connects across the value ecosystem
Data and information is power	Data and information is progress
Data and information is categorised	Data and information swarms
Access to information is controlled and privileged[a]	Access to information is open and accessible

[a]Source: Wurman, Richard Saul, *Information Anxiety2.* 1989 (Indianapolis, Indiana: QUE, 2000)

Network perspective can be developed through theory and practice. We noted in the previous section that understanding social network theory can enhance and get things done in ecosystems. Rob Cross argues in an HBR interview, 'Many people take a misguided approach to networking. They go astray by building imbalanced networks, pursuing the wrong kind of relationships, or leveraging relationships ineffectively.'[51] He proposes four steps to building an effective network:

- *Analyse* your network by classifying in what way individuals benefit you
- *De-layer* your network by stepping back from ineffective connections
- *Diversify* your network by including more enabling connections
- *Capitalise* your network by being active with the network you have selected

This is about building a useful network. Ivan Misner and Brian Hilliard argue in *Networking Like a Pro* that social networks have devalued networking by becoming simply a vehicle to build brand and credibility—it is not uncommon now to have a dormant network that has been suggested by AI technology.[52] Future leaders will need to have a better understanding of how networks work and the different roles and functions in networks. This is the core of network perspective and DQ.

Navigationalism

Navigationalism, a theory by Tom H. Brown,[53] explores how learners seek and use information as a learning process. According to Brown, 'In a navigationist learning paradigm, learners should be able to find, identify, manipulate and evaluate information and knowledge, to integrate this knowledge in their world of work and life, to solve problems and to communicate this knowledge to others.'[54] Future leaders do not just need to know how to manage data and information; they need to know how to navigate around the masses of information and extract the useful bits.

Information Transparency

The concept of knowledge is power[55] has no place in Leadership 4.0. Progressive companies such as 7-Eleven, Walmart, and Google encourage open cultures and knowledge transparency. Thomas Power talks about open, random, and supportive mindsets rather than information hoarding.[56]

Towards New Pedagogical Methodologies for Developing Business Leadership Mindsets to Embrace a Volatile World

Pedagogical methodologies for educating leaders around new behaviours and mindsets will also need to change to reflect the advanced digital age of Industry 4.0. As we explored in Chap. 3, the current approach is highly selective, elite, cerebral, influence-led, and relational. This has steered leadership down a specific methodological path where cognitive reframing is seen as the primary way to develop leaders using competency/skill-based frameworks and categorisation tools and models. Such an approach inclines towards formal leadership education and organisational programmes.[57] This programmatic approach, represented in organisational leadership frameworks, pipelines, and pyramids, is transmitted mainly in classrooms, and has been traditionally seen as the most effective way of developing influence-based leadership where leaders are cultivated in behavioural laboratories. The knowledge/skills/competency-based model to developing leaders, which has dominated business leadership development for four decades, is not fit for purpose for leadership 4.0. It has created a formulaic leadership, a dependency that undoubtedly served organisations well in the pre-global, pre-internet, and pre-shared economy age when law of supply outstripped law of demand, where companies followed five year plans, where consumers were restrained, and where permanent ranked employees were fixed in the hierarchy and did as they were told. As we have said many times now, the organisational world has changed, the old cognitive models are failing to prepare leaders for this era of digital transformation and empowered consumerism where leaders need to learn to think and act for themselves outside of the glass container.[58] New methodologies are needed to encourage vertical growth.[59]

There will be no place for expensive classroom-based training or equally expensive constructivist supported field learning. Executive education of the future will be technology-based, networked, and principally self-directed. There will be no centrally organised learning programmes, as such, but personalised/customised leadership programmes accessed via learning management systems (LMSs) and supported by learning coaches and even robocoaches.

Here are some methodological scenarios for future leadership development.

Technology-Based Learning

Technology-based learning has been around for some time. Electronic simulation, for example, has been used in the aviation industry since the mid-1980s.[60] Technology-based learning includes any form of learning delivered via the electronic medium. Collaborating online through learning networks is going to be critical and we have already profiled in Chap. 5 some of the collaboration tools that will support this.

A recent study posits that 78% of associations use some form of LMS and that elearning is set to become a $37.6 billion dollar market by 2020.[61] Digital and open source libraries such as Project Gutenberg, open library and library archives are making electronic books and materials freely available and creating easy access to online libraries and educational materials. Google's plan to create a global digital library hit some legal issues after digitalising 25 million books from major university libraries. There are 3.5 million ebooks on Amazon Kindle.[62] There will be more electronic devices in the future to help develop leaders.[63]

Virtual, Augmented, and Mixed Reality

As we have already touched upon in this chapter, there are some interesting developments taking place in the field of VR. VR is being used in employee training in major companies including Walmart,[64] KFC,[65] and UPS.[66] At the end of our conversation together, Benjamin Quaiser from ESMT painted an exciting technology-based future for developing leaders. Regarding VR, he said, only costs and licencing are the obstacles for a full-scale global rollout of leadership behavioural training using VR. Regarding augmented reality, Dr. Quaiser and his team are currently developing a physical game with augmented reality elements. Even more exciting, there is the possibility of virtual psychometrics where psychometrics such as measuring DQ may be designed into a VR experience where participants' reactions are automatically registered. VR psychometric assessment is already being used in research and development.[67] We can see that it is not just traditional skills and competency-based training that this advanced technology is targeting. It is also being used in behavioural-based arenas such as leadership and empathy training.[68]

The key advantage for VR, MR, and AR in developing leaders is that it does not have to be carried out in a group setting, but can take place in a private

meeting room. There is no timely setup and it can be designed to fit the participant's personal business experience and schedule. With wearable technology, there is also scope to monitor the participant as they play virtual leadership games—thus creating opportunities for this technology to develop sensemaking and situationism. In the long term, this VR technology will reduce design and participant costs, be more flexible, and provide a greater reach to develop leaders across the enterprise.

Leadership Development and Future Technological Trends

The Centre for Creative leadership has published a fascinating white paper on this subject.[69] They imagine such things as instant skilling, wearable technology (particularly to monitor employee stress levels and well-being), and augmented intelligence to assist in leadership development of the future. McKinsey sees this new technology as a means to raise our DQ. 'Wearable technology, adaptive interfaces, and integration into social platforms are all areas where B2C companies have innovated to make change more personal and responsive'.[70]

Networked Learning

The idea of networked learning precedes the internet. In his classic study, Ivan Illich envisions the future of learning through networks, 'The alternative to social control through the schools', Illich argues, 'is the voluntary participation in society through networks which provide access to all its resources for learning.'[71] In 1977 Alexander et al. also predicted a future of networked learning:

> Instead of the lock-step of compulsory schooling in a fixed place, work in piecemeal ways to decentralize the process of learning and enrich it through contact with many places and people all over the city: workshops, teachers at home or walking through the city, professionals willing to take on the young as helpers, older children teaching younger children, museums, youth groups, traveling, scholarly seminars, industrial workshops, old people and so on. Conceive of all these situations as forming the backbone of the learning process; survey all these situations, describe them, and publish them as the city's 'curriculum'; then let students, children, their families and neighborhoods weave together for themselves the situations that comprise their 'school' paying as they go with standard vouchers, raised by community tax. Build new educational facilities in a way

> which extends and enriches this network … use the real work of professionals and tradesmen as the basic nodes in the network.[72]

This was written over 40 years ago but is still fresh and relevant. What all this points to is that leadership development is becoming entirely network-based with opportunities for instant feedback (Ifeedback), online coaching, and online community-based leadership development. After each conversation, interaction, or collaboration, digital surveys will solicit feedback that will generate instant evaluations and feed into ongoing performance reviews. eCoaching will also be commonplace. Hanna McNamara defines eCoaching as 'any form of coaching that takes place using electronic media, with or without the input from a real coach'.[73] Learning through the network and receiving ifeedback and ecoaching from networked communities will be commonplace in the future.

Self-Directed and Metalearning

The term self-directed learning was coined by Malcolm Knowles who defined it as 'a process in which individuals take the initiative without the help of others in diagnosing their learning needs, formulating goals, identifying human and material resources, and evaluating learning outcomes'.[74] This is based on Knowles's five principles of adult learning: that adults are more independent, experienced, ready, orientated, and motivated to learn than children.[75] Successful entrepreneurs such as Richard Branson, Bill Gates, Mark Zuckerberg, Andrew Carnegie, Michael Dell, and Steve Jobs were autodidacts and flourished in self-learning environments. They share this in common with an exhaustive list of philosophers, scientists, inventors, US presidents, and creative artists, including John Stuart Mill, Albert Einstein, Thomas Edison, Benjamin Franklin, Abraham Lincoln, George Washington, Leonardo da Vinci, Wolfgang Amadeus Mozart, Charles Dickens, David Bowie, and Steven Spielberg. As we shift into collaborative and swarm leadership (which requires a more collective leadership), centrally organised leadership programmes will decline and self-directed leadership learning supported by personal AI or robot learning coaches and learning management systems (LMS) will begin to flourish. The Web-based LMSs will be a virtual roadmap for leadership with personal leadership plans, online resources (eBooks, webinars, online courses), networks, eCoaches, and eMentors. Leadership development of the future will be like going to the gym—it will be a short,

self-paced workout with personal programmes supported by a body of personal development eCoaches and robocoaches.

A Different Approach to Developing Leadership Mindset

For over 100 years, we have been teaching business leaders (mainly in classrooms) that they are the centre of innovation and decision-making. The great man theory of leadership[76] and charismatic leadership[77] propounded the idea that leadership is an innate superhuman quality. From the 1980s onwards, transformational leadership emphasised the role of the follower and a more relational form of leading,[78] and yet, let's face it, a directive leadership culture still persists. Leaders are routinely recruited from elite universities, fast-tracked into leadership roles through succession rites and taught formulaic and categorising frameworks and models in order to manage and influence others. The cult of the charismatic leader lives on. Leaders got away with dissonant behaviours in Industry 3.0; they will not get away with such behaviours in Industry 4.0. Leaders need to ditch the corrosive mindset that they are the cognitive superheroes, powermongers, strategic visionaries, and sole decision-makers for the organisation. This is going to require a holistic effort of decentralising structures, building collaborative networks, and educating the organisation around the benefits of collective action.

This chapter has been reviewing leadership mindsets in readiness for a different kind of world of organised work that has been slowly evolving over the last 40 years and which is set to intensify because of the social, economic, and technological changes that Industry 4.0 is generating. This shift, in essence, is away from ego-driven leadership where innovation, decisions, communication, and direction originates from individual leaders towards collaborative innovation and collective decision-making which will require a whole systems approach to developing leaders. What we have seen in the three core mindset shifts in this chapter is that the themes, subjects, and content of future leadership programmes will look and feel radically different from what an average participant on a leadership development programme experiences today. Figure 6.4 summarises this picture.

Leadership mindsets of the future will not be based on the principle of influencing and motivating others; nor will it be prescribed by the organisation. It will be a more agile, collaborative, and responsive leadership and this is going to be reflected in educational content around building collective

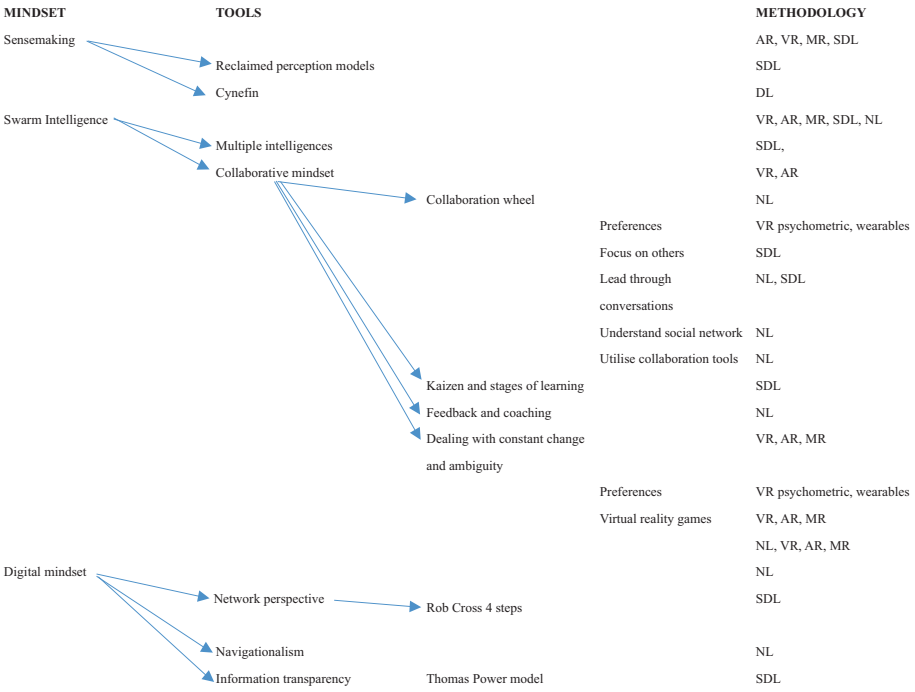


Fig. 6.4 The future of developing leadership mindset at a glance

mindsets, with its emphasis on sensemaking, collaborating/swarm intelligence, connectivism, network perspective and digital quotient. The learning will not be in classrooms but self-directed through networks and technology-based learning.

Companies need, as a matter of great priority, to prepare for this new paradigm shift. This is the subject of the final chapter.

Notes

1. This is a variation of a traditional parable widely known as the three stonecutters. A more classical version of it can be found at J.P. Girard and S Lambert, "The Story of Knowledge: Writing Stories that Guide Organisations into the Future", *The Electronic Journal of Knowledge Management*, Volume 5 Issue 2, 161–172, 2017.
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4. Danel M. Russell, Mark J. Stefik, Peter Pirolli, Stuart K. Card, "The cost structure of sensemaking", proceedings of INTERCHI '93 conference on Human factor in computing systems. 269–276. Amsterdam, Netherlands, 1993.
5. Winston R. Sieck Gary Klein, Deborah A. Peluso, Jennifer L. Smith, Danyele Harris-Thompson, "*FOCUS: A Model of Sensemaking*, *Technical report 1200*", United States Army Research Institute for the behavioral and Social Sciences, Virginia, May 2007.
6. Sensemaking has been defined over the years in variety of ways. As simply meaning connecting the dots—Minarik, Melanie, *Knowledge Building Through Sensemaking: Connecting the Dots: Information Overload: What to do with all of the New Information,* (Germany: LAP Lambert Academic Publishing, 30, 2009); a tool for how people 'make sense out of their experience in the world.'—Duffy, Maureen Whelehan, *Sensemaking in classroom conversations: the shift from "not understanding" to "understanding",* Ph.D. Thesis (Nova University, 1993); a decision-making tool—Sally Maitlis, Marlys Christianson, "Sensemaking in Organizations: Taking Stock and Moving Forward", *The Academy of Management Annals*, Vol. 8, No. 1, 57–125, 2014; a mindset—Gary Klein, Brian Moon, Robert R. Hoffman, "Making Sense of Sensemaking 1: Alternative Perspectives", *IEEE Intelligent Systems*, Vol. 21, No. 4 July August, 2006 and Gary Klein, Brian Moon, Robert R. Hoffman, "Making Sense of Sensemaking 2: A Macrocognitive Model" IEEE Intelligent Systems, Vol. 21, No. 5 September/October, 2006; A state of perception—Ian Colville, Andrew Brown, Annie Pye, "Simplexity: Sensemaking, organizing and storytelling for our time", *Human Relations*, Volume: 65 issue: 1, 5–15. 9 January, 2012; Sally Maitlis, "Social Processes of Organizational Sensemaking", *The Academy of Management Journal*, Vol. 48, No. 1, 21–49, 2005 and Weick, K. E., *Sensemaking in organizations* (Thousand Oaks, CA: Sage, 1995) and Karl E. Weick, "Sensemaking in organizations: small structures with large consequences", in J Keith Murnighan (ed) *Social Psychology in Organizations: advances in theory and research. 10–37* (New Jersey: Prentice Hall, 1993).
7. Karl E. Weick and Kathleen M. Sutcliffe, "Organizing and the Process of Sensemaking", *Organization Science* Vol. 16, No. 4, July–August, 2005, 409–421, 415.
8. In his classic study on rational choice, Herbert Simon considers how most decisions are based on 'satisficing' (a portmanteau of satisfy and suffice) which leans towards a satisfactory and not an optimal solution and is constrained and 'bounded' by cognitive limitation, access to data, and time. Herbert

A. Simon, "A Behavioral Model of Rational Choice", *The Quarterly Journal of Economics*, Vol. 69, No. 1, 1955, 99–118. Chun Wei Choo and Nick Bontis discuss rational choice in Choo, Chun Wei, Bontis, Nick, *The Strategic Management of Intellectual Capital and Organizational Knowledge* (Oxford: Oxford University Press, 2002).

9. 'It is the job of the sensemaker to convert a world of experience into an intelligible world. That person's job is not to look for the one true picture that corresponds to a pre-existing, performed reality.' Karl E Weick, "Sensemaking in organizations: small structures with large consequences", in J Keith Murnighan (ed) *Social Psychology in Organizations: advances in theory and research*, 10–37 (New Jersey: Prentice Hall, 1993) 14–15. Deborah Ancona, says, 'Sensemaking is not about finding the "correct" answer; it is about creating an emerging picture that becomes more comprehensive through data collection, action, experience, and conversation.' Deborah Ancona, "SENSEMAKING Framing and Acting in the Unknown", in Scott A. Snook, Nitin N. Nohria, Rakesh Khurana (eds). *The Handbook for Teaching Leadership: Knowing, Doing, and Being* (Los Angeles, CA: SAGE, 2012) 6.
10. The US Coast Guard Training Manual, Chapter 5, Section 5-1, from the Team Coordination Training Student Guide (8/98) says, 'Situational Awareness is the ability to identify, process, and comprehend the critical elements of information about what is happening to the team with regards to the mission. More simply, it's knowing what is going on around you.' Traditionally applied to the operating of complex machinery and military manoeuvres, it is increasingly being applied to management and leadership—leaders need situational awareness not just to fly airplanes or for combat purposes but to help in their judgement and decision-making about unexpected events. Situational awareness, or knowing what is going on around you, is a key ingredient of sensemaking—it provides the knowledge and data. See Gary Klein, Brian Moon, Robert R. Hoffman, "Making Sense of Sensemaking 1: Alternative Perspectives", *IEEE Intelligent Systems*, Vol. 21, No. 4 July/August, 2006; and Gary Klein, Brian Moon, Robert R. Hoffman, "Making Sense of Sensemaking 2: A Macrocognitive Model", IEEE Intelligent Systems, Vol. 21, No. 5 September/October, 2006.
11. Karl Weick, "Sensemaking in organizations: small structures with large consequences", in J Keith Murnighan (ed) *Social Psychology in Organizations: advances in theory and research* (New Jersey: Prentice Hall, 1993) 10–37.
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22. The literal translation is 'the multiple factors in our environment and our experience that influence us in ways we can never fully understand'.
23. My use of gaming examples here is inspired by Erwin van der Koogh's blog. Erwin van der Koogh, "Understanding complexity", Bitgenics, June 25, 2017, accessed June 16, 2018, https://blog.bitgenics.io/understanding-complexity-cf1771fa087d
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40. Paul Grice's four maxims: maxim of quality, be truthful; maxim of quantity, do not talk for too long or for too little; maxim of relation, be relevant; maxim of manner, be clear. Paul Grice, "Logic and conversation", in Cole, P and Morgan, J. *Syntax and semantics*. 3: Speech acts (New York: Academic Press. 41–58, 1975).
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7

Future-Proofing Organisations for Leadership 4.0

'A time of turbulence is a dangerous time,' wrote management consultant and author Peter Drucker, 'but its greatest danger is a temptation to deny reality'.[1] The fourth industrial revolution, which is shaped by the emerging technologies of robotics, new sources of energy, and artificial intelligence, is creating new lifestyles, new expectations, fresh economic perspectives, and new political and geopolitical developments. This looks and feels different from the old way of doing things and is creating volatility, uncertainty, complexity, and ambiguity. As this volatile 4IR wave edges closer, the greatest danger, as Peter Drucker says, is for organisations to do nothing and continue to organise structures, services, products, people, leadership, and LD the way it has been done for 50 years.

There is a gap that has built up between organisational life and the outside hyperconnected world. We have seen this gap being played out with the United Airlines debacle in 2017, where the company tried to defend dragging a passenger off an overbooked aeroplane whilst the entire Twittersphere and world markets went into meltdown. Leadership urgently needs to bridge this gap through collaborative networks if it is to stay consumer relevant and avoid such calamitous events that befell United Airlines. Packing executives off on residential leadership programmes and teaching them how to build charisma and influence people is not going to plug the gap. We have explored in these chapters how a systems approach to developing leaders is the way forward. Decision-makers need to future-proof the organisation by developing ecosystems and collaborative networks in order to break down organisational barriers

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and create collaborative and adaptive communities and a fit-for-purpose responsive leadership.

This final chapter is a no-nonsense account of the key issues facing organisations today in the context of 4IR, leadership, and developing leaders and some practical steps that organisational decision-makers need to take to future-proof their organisation and help it survive the VUCA storm that is on its way.

The Three Realties

This book has thrown up three hard realities that should be on every single organisational decision-maker's mind and whiteboard.

Reality 1
We are entering the era of the fourth industrial revolution which is set to alter the relationship between consumer and provider.

The emerging technologies that are shaping the fourth industrial revolution are edging us towards a hyperconnected, mobile, hyper-sped, and transhuman world. Consumers will have greater choice and voice than they have ever had in the history of consumerism. The traditional routes to consumers are changing. Some services are now app-based, more purchasing is done online which in certain countries is leading to high street closures,[2] and consumers are more informed and critical about the choices organisations make.[3] The trend towards a consumer-led and even prosumer economy[4] has steadily been on the rise and is set to continue. Direct consumer input regarding the design and choice of products/services and even organisational policymaking will be one of the main hallmarks of Industry 4.0. Organisations that do not embrace this connected consumer and involve them in every aspect of shaping and designing the product or service will suffer at the hands of choiceful, connected, and informed customers. It is clear that organisations need to design their operation with the consumer in mind and engage with the consumer at every opportunity.[5]

Reality 2
Organisations will need to rethink how they are structured and how they collaborate, innovate, and make decisions if they are to stay afloat.

Organisations have been slow to understand how the new technologies and globally connected consumers have impacted their enterprise. They have failed to take the lead on exploiting social media and have been slow to react to customer concerns expressed online. As we progress towards more powerful data systems and AI applications, this needs to change. The only way it can change is for organisations to look at the way they are structured and abandon centralised egosystems, where innovation and decision-making is based on status, positional power, and hierarchy, towards open and agile ecosystems where innovation and decisions are decentralised and distributed. An ecosystem structure is the best supporting structure for open, AI-based, cross-border, collaborative stakeholder networks which is where organisations need to be.

Realty 3

Traditional ideas of leadership and developing leaders will not work in Industry 4.0.

A different kind of leadership is required within ecosystems and collaborative networks, away from the leader as a source of knowledge and decision-making to a connected leader extracting information and learning from the intersection of ideas generated from collaborative networks of human communities and digital decision-making. You recall Stephen Covey's definition of leadership as the person who climbs the tallest tree and shouts 'wrong jungle'.[6] The future leader, with the support of AI and data mining technology, senses the ongoing and emergent signals and patterns that are trafficking through the network like primitive drumming and helps choreograph a collaborated effort of innovation and decision-making. This is being labelled swarm leadership. The point was made in the introductory chapter that this is not simply shared leadership which connotes distribution of power and authority, this is setting up the organisational infrastructure—or hive—in such a way that encourages open innovation and decision-making from collaborative communities on the design and direction of the business.

Organisational leadership will need to shift from being a single agent who is the nucleus of ideas and decision-making to a cybernetically collective leadership that is defined and shaped by the very system—a leadership that swarms in collaborative learning networks, using the principles of swarm intelligence. Here the leader initiates and choreographs the networked learning and steers it towards commercialisation. The leader no longer sits at the top of the tree barking out orders. This instant collective swarm that is connected and networked with community stakeholders will be supremely agile and ever-ready to deal with volatile events.

As we have seen in this book, the idea of swarm leadership and the connector-leader will need a whole new development approach that helps emerging leaders understand the importance of ecosystems, networks, and connectivity, and to cultivate responsiveness and readiness through such mindsets as digitalism and sensemaking. There needs to be a decisive shift away from leadership 3.0's programmatic emphasis (some may say obsession) with influencing, cognitive restructuring, and individual intuition. Such a horizontal approach is mainly taught in classrooms to a select group of HiPO graduates, which produces scripted and dependent leaders. The emphasis should be on vertical growth where diverse groups of leaders are developed in practical ways that build cognitive readiness and responsiveness within a broader leadership ecosystem—what Andrea Derler, Anthony Abbatiello, and Stacia Garr described as focusing on the fishpond rather than training the fish.[7]

Specific Actions Organisational Decision-Makers Need to Take to Respond to These Realties

There are three sets of actions, divided into the three systems of structure, connections, and mindsets, that organisational decision-makers needs to be focusing on with regard to future-proofing the organisation for leadership 4.0. There are also some general actions that need to be taken as part of the change process, but this will be dealt with later in the chapter.

Structure

It goes without saying that different organisations will be at different stages and levels of structural readiness concerning the migration to a swarm business, but here is a summary of general restructuring that needs to take place to prepare the enterprise for IR4.

1/ As was explored in Chap. 4, organisations should be reviewing their structures and eliminating any operant conditioning that undermines responsive/swarm leadership. In particular, organisational designers should be looking at:

- Reward systems
- Performance appraisals

- Staff ranking
- Job titles
- Regulations

Each of these conditioning structures should not be generating or promoting positional power, control, and status. Any conditioning structure that places the leader in authority (based solely on their positional power) should be ditched. Organisational designers should focus on behaviours rather than status and have organisational collaboration, collective thinking, and collective decision-making as the primary driver in designing the organisation for Industry 4.0. One-off end of year appraisals should be scrapped. No employee should be appraised by a single boss; rather, there should be ongoing collective appraisals, catchups and 360 feedback from peers, customers, suppliers, and other key stakeholders.[8] Large organisations such as Microsoft, Dell, and Adobe have all replaced their one-off appraisal system. There is some excellent software now to assess and review online performance, real-time monitoring,[9] and social capital (such as KLOUT and Peer index). There needs to be a shift towards a more self-managed organisation where traditional performance management and performance feedback is digitally tracked through the system and linked to salaries and remuneration. Regulations should be simplified and easy to understand and applicable to everybody Paygrades should be transparent and job titles levelled. The culture of 9-5 presentism needs to be abolished once and for all—recognition and reward should be given to accomplishments and not the amount of time you spend at the office. The pay divide gap (including bonuses and perks) between executives and workers and men and women should be narrowed.[10] Google has been ahead of the game in most of these examples. Google managers cannot make unilateral decisions concerning hiring, firing, performance appraisals, salary increases, awards, or promotions.[11]

2/ Organisations should undertake a major review about how their enterprise is structured. In my research into the natural world, I came across an extraordinary story of how termites build their nests. The familiar mounds, for certain species of termites, are among the most complex structures in the insect world with the inanimate part of the nest (the mound) structured in such a way to act as a ventilation and cooling system for the entire nest (a sort of air conditioning unit). To apply this to organisations, if they are structured in the right way, they create vitality and the right conditions for the organisation to thrive. The long-term aim should be to

move to an ecosystem that facilitates connectivity and collaborative networks, and networked learning which has customer connectivity and digital transformation at its heart.[12]

A quick win here would be to review departments and silos and create broad circles of internal networks that embrace cross-divisional functions and expertise. This would stimulate intersectional thinking and create a Medici effect. We have seen from Frans Johansson's Medici effect that great ideas and innovation come from 'moments of intersection'. You recall Johansson saying, 'When you step into an intersection of fields, disciplines, or cultures, you can combine existing concepts into a large number of extraordinary new ideas.'[13] For too long in corporates and large organisations, turfism has prevailed. Unhealthy rivalries exist, particularly in large companies, between departments. This closes down collaboration and the opportunity for the Medici effect to come into play. Individuals who are not as well acquainted with specialist departments or routines can sometimes provide radical and innovative insights that the experienced 'expert' can miss. Organisations and leadership need to assess their enterprise and break these silos. For example, leadership development should not be in a single department but part of a cross-border group that includes organisational design and effectiveness, knowledge management, diversity, recruitment, and learning.

Creating these 'intersectional moments' will prepare the ground for a fully restructured model. In the long term, organisations need to dismantle actual hierarchies in favour of ecosystems and wirearchies—this subject will be discussed shortly—but the starting point is to promote intersectionality and cross-border collaboration.

Connections

Writing in the *Foreign Policy Journal*, Homaira Kabir reports, 'In an interdependent world, where we are globally connected through an impenetrable thicket of interrelatedness, we need a leader who can harness our interconnectedness and use it as our greatest strength.'[14] The direction of travel that this book has taken is clear. Companies need to shift from organised structures to swarm communities where a state of interconnectedness exists both in and outside of the company parameters. In this open collaborative network of internal and external communities, leaders will be choreographers, weavers, and connectors and *not* superheroes.

The secret to building a networked organisation and an open collaborative system that transcends traditional company boundaries and works with

collaborative communities, lies in having the right organisational structure. We have explored in this book some essential preparations that need to be done to start to kick-start this. Organisational decision-makers should be cultivating strategic collaborative networks and increasing what Ben Hecht calls their 'collective impact' with outside parties including competitors, suppliers, partners, and customers. To assist in this, organisations are advised to revaluate their policies on secrecy, firewalls, and confidentiality, which is the trademark of centralised and closed organisations, and move to a more open system. Ben Hecht gives some practical pointers on achieving this in his HBR article, advocating the need to establish working practices, transcend parochialism, use real-time data, share learning, and be well organised.[15] There needs to be a reallocation of resources and funds away from centralised leadership programmes, planning departments, and costly consumer market research, to investment in technology, networks, networked learning, collaborative tools, and dedicated resources to operate open collaborative networks.

Organisations need to make data science and data analytics the DNA of their organisation.[16] Commentators suggest this can be done by appointing data and analytics specialists and a chief data officer. Moreover, all new intakes should have a high level of digital quotient.[17] This collaborative network should have some specific qualities. It needs to be a self-organising, emergent, complex adaptive system that swarms in on a set of challenges. For this to happen, the network will require some big rules around collaboration (which we listed in Chap. 5), diversity, and some AI collaborative tools to help filter and harvest the collective ideas. These big conditions together with the open ecosystem structure should allow collaborative swarming networks to gain momentum and be able to (cybernetically) self-regulate—just like Watt's *Governor* profiled in Chap. 2 (Fig 2.5).

Mindsets

Leaders need to embrace new mindsets relating to collaboration, interconnectedness, navigationalism, digitalism, open systems, swarm intelligence, sensemaking, and shared innovation and decision-making. We have already examined the structures and connections that surround leaders and explored how mindset training alone is not sufficient to induce significant behavioural change. We looked at how ecosystems, collaborative networks and, connections serve to reinforce leadership development. This is the (holistic) whole systems approach to developing leaders as represented in Fig. 3.1.

We are now approaching Industry 4.0 and there can no longer be a disconnect between structure, mindset, and connections. There needs to be a more coordinated effort between these three leadership influences. We must depend less on the cognitive abilities of our leaders and more on the idea of leaders as organisational connectors who are observing and choreographing connections and networks inside and outside the company—Howard Gardner calls this existential intelligence. The one thing that should be becoming clear in this analysis is that the way we have historically taught leaders within organisations is cognitively influenced and that the three traditional pillars of learning (behaviourism, cognitivism, and constructivism) need to be better aligned with organisational objectives for developing leaders. Moreover, we need to recognise that the attainment of knowledge has changed since the rise of the internet, and embrace the principle of connectivism and the belief that knowledge resides outside of us, in databases, networks, and webpages.

With regard to educational programmes, it is clear that the influence-led and charisma-heavy leadership 3.0 approach is not conducive to responsive and swarm leadership 4.0. The current educational pedagogies, categorisation tools, and cognitive methodologies are not fit for purpose.[18] What is being proposed in this book is that there needs to be a content shift away from developing leaders horizontally through organisationally led and force-fed restrictive reframing tools towards a cognitive readiness and vertical growth approach to developing leaders where leaders learn how to sensemake, choreograph, weave, and navigate volatile environments and cultivate networked learning. Methodologies and pedagogies are going to have to change. The already discredited classroom approach to developing leaders needs to be jettisoned in preference for a self-directed set of interventions with a personalised training programme administered by a learning management system. It should be networked and technology-based. Leveraging technology means that organisations will be able to reach out and develop leadership mindsets across the enterprise and expand the leadership talent pipeline, reducing the costly and selective classroom training approach to developing leaders. Leaders should be taught in a systems way rather than groomed in management structures through succession rites. There needs to be a shift from processing leaders in frameworks and pyramids in a predominantly management setting to a more personalised approach where people can realise their leadership potential from all corners of the organisation using learning management systems, personal trainers, and technology such as VR headsets and

wearables. There needs to be an acknowledgement that effective behavioural change comes from a whole systems approach and that organisations will need to personalise their approach and create technological scaffolding (through networked learning, eCoaching, eMentoring) that supports self-developed leadership initiatives within a networked learning framework.

The Role of the LD Advisor

The traditional role of the LD advisor is set to change. LD advisors are normally assigned geographical locations and leadership groups (such as graduates, first-time supervisors, mid-level leaders, senior leaders, or executives) and look after the educational learning needs of their population. Normally they do not get too involved in the day-to-day development of leaders—leaving that to managers and supervisors. Typically, their role includes undertaking regular business needs assessments to understand business perspective, and producing a set of leadership competencies to be used in the design and development of leadership interventions. In a non-classroom programme, such as an online programme, LD advisors will typically hire third parties and work directly with them on competencies and content for the programme. Normally, they have very little involvement once the programme goes live. In a classroom-based programme, LD advisors will either design this themselves, head up a design team, or hire design specialists. Once the programme is designed, they typically undertake classic programme management duties such as facilitation and overseeing the event. Sometimes they get involved in coaching programmes, but this is often farmed out to third party coaching specialists. The rest of their time is spent gathering statistics relating to the programmes, including reach, diversity, costs, and course assessments.

The LD advisors' role will be very different in the future. This study anticipates the cessation of classroom training as a methodology for developing leaders. Since this makes up 80% of the day-to-day job of an average LD advisor, it is clear there is going to be radical change to the LD role. What is more, this study anticipates that leaders will no longer be recruited for their cognitive skills, but will be connectors within collaborative networks, and that technology-based learning, networked learning, continuous, and self-directed learning will be the chief methodologies for developing leaders of the future.[19] Developing leadership will be more widespread as leaders are

recruited from broader sources. The LD advisor will have to forge closer links with recruitment, knowledge management, diversity, and organisational effectiveness. They will need to resist silos and embrace intersectionality. The role will also expand to include organisational design and collaborative networks and future LD advisors will need to be much more knowledgeable about these specialised areas. They will no longer be restricted to geographical locations or specific demographics, but will work across the organisation. They need to be moderators, administrators, and contributors to a central learning management system that digitally generates data readings form the various digital devices that support leaders. Schedules for self-directed VR and networked learning, eLearning resources, and individual leadership eFeedback will feature on the LMS. LD advisors will not need to do any statistical assessments as this will be digitally generated through the learning management system but they will need to be digitally savvy. Crucially, LD advisors should play an active role in raising awareness of the collaborative environment and culture and help cultivate networked learning and collaborative communities. They will need to be network weavers, helping leaders build their internal and external network and learning contacts.

In the future, LD advisors will most likely have backgrounds in neurology (to reflect the shift towards neurological assessments), systems, networking, or organisational culture, rather than the more traditional LD or training professional qualification. They also need to keep up to date with technological developments in learning, data analytics, and collaborative tools, and they need to constantly look for new methodologies that can deliver learning that is always on, easy to use, and creates consumer-like experience.[20]

Managing the Change Process

It is clear that future-proofing organisations for IR4 and leadership 4.0 is going to require an ongoing organisational change process.[21] This chapter proposes four major components to this change effort: a phased transition, emergent change through networked learning, education and culture programmes, and a recruitment and redundancy initiative. Decision-makers need to give this their urgent attention. The McKinsey report on raising digital quotient flags this sense of urgency:

> For many organizations, a five or even a three-year strategic plan is a thing of the past. Organizations that once enjoyed the luxury of time to test and roll out new initiatives must now do so in a compressed timeframe while competing with

> tens or hundreds of existing (and often incomplete) initiatives. In this dynamic and fast-paced environment, competitive advantage will accrue to companies with the ability to implement new priorities and processes quicker than their rivals.[22]

Phased Transition

The introductory chapter was clear that leadership 4.0 will not eradicate leadership; rather, there will be a new kind of collective leadership that functions primarily through collaborative networks where key innovation and decisions are collectively formed through swarms using swarm intelligence. Leadership, therefore, will be part of a self-organising, wirearchical, agile, responsive, and maturing process (SWARM). This complex adaptive system is part of a self-generating cybernetic system where leadership is intrinsically part of the swarm system itself. The change process needs to reflect this. It needs to be emergent (and not top-down) and to alter leadership mindsets through structures and networks as well as through formal education. A phased transition would suggest something akin to Kotter's idea outlined in his 'accelerate!' theory of a networked change initiative working alongside the traditional day-to-day running of the organisation:

> We cannot ignore the daily demands of running a company, which traditional hierarchies and managerial processes can still do very well...
>
> The existing structures and processes that together form an organization's operating system need an additional element to address the challenges produced by mounting complexity and rapid change. The solution is a second operating system, devoted to the design and implementation of strategy, that uses an agile, networklike structure and a very different set of processes. The new operating system continually assesses the business, the industry, and the organization, and reacts with greater agility, speed, and creativity than the existing one. It complements rather than overburdens the traditional hierarchy, thus freeing the latter to do what it's optimized to do. It actually makes enterprises easier to run and accelerates strategic change. This is not an 'either or' idea. It's 'both and'.[23]

Effectively there will exist two gears in the change process. Gear 1 will include the setup of collaborate networks to work alongside the traditional structures. These networks should have customers, partners, and even competitors in order to benefit from intersectional ideas and the Medici effect. We saw in Chap. 5 how this approach has been successful in Daimler where the organisation is seeking to create a 20% swarm business by 2020. In this

phase, organisations should set up small collaborative networks to take on specific challenges. Joao Dias and Rohit Bhapka from McKinsey call these networks 'digital factories', where the organisation allows a networked swarm, squad, or scrum, to operate outside of the conventions and rules of the company on issues that will advance the enterprise.[24] Another important future-proofing element to gear 1 is to begin to phase out some of the operant conditioning structures such as job titles, one-off performance appraisals, staff ranking, reward systems, and complex regulations. This phase should also include a recruitment drive for individuals who excel in open, collaborative networks and can work unsupervised in a swarm environment. We will return to the issue of recruitment shortly.

Gear 2 will require some ambitious internal restructuring to merge divisions and silos into larger domains. In Chap. 4, there was an example of an ecosystem with three major domains: people and resources (recruitment, development, remuneration, culture), platform and process (network, systems, finance, technology), and strategy and execution (commercialisation, design, development, marketing). These broad domains benefit from intersectional and cross-boundary thinking, Chap. 4 looked at some practical ways to phase in these ecosystems. Gear 2 will also mean the acceleration of the organisation towards collaborative networks. McKinsey provides practical suggestions from their study on digital quotient:

> Companies know that rigid, slow-moving models no longer cut it. The challenge is to move toward a structure that is agile, flexible, and increasingly collaborative while keeping the rest of the business running smoothly. Successful incumbents become agile by simplifying. They let structure follow strategy and align the organization around their customer objectives with a focus on fast, project-based structures owned by working groups comprising different sets of expertise, from research to marketing to finance.[25]

Companies need to align their organisational structures, talent development, funding mechanisms, and key performance indicators (KPIs) with their adopted digital strategy. This phase may require some downsizing and redundancy. This will be addressed shortly.

This is not a classic top-down change programme; it has two gears that builds momentum through 'demonstration events'[26] and emergence. Figure 7.1 summarises this two-gear approach.

The most important thing here is to have a clear vision, communicate the vision, build momentum, and eradiate structures that foster traditional leadership power. The Typeform transition to a swarm business is insightful. They



Fig. 7.1 Two-gear approach for creating a swarm enterprise

say on their blog, 'The secret to success is getting everyone involved as early as possible. And being open to change when it's needed'.[27]

There is a clear role for executive leadership. Change does not happen overnight and needs steering (you recall that the origin of cybernetics is linked to steersman). Daimler's Leadership 2020 initiative is a five-year plan to get the organisation to 20% swarm. Traditional leadership will be necessary to oversee the transition period in the gear 1 and gear 2 phases. Once the organisation is a swarm business, there is still an ongoing role for the executive—in the introductory chapter the queen bee lacks authority but nurtures the hive and helps reproduce it and cares for its well-being and success. Howard Gardner's existential intelligence, which is part of his multiple intelligences theory, is relevant here. In *Multiple Intelligences*, Gardner describes the case of a company president who looks out for the 'broad goals of the company, the ever-changing global landscape, the needs and fears of her workers … to create a master narrative that captures these realities and conveys meaning to those who look to her to provide a convincing rationale for their collective enterprise'.[28] The executive leader's role is not about power or cognitive supremacy; it is purely a functional role that is connectivist and existential in nature.

Leaders need to cultivate connected organisations and networks, and emerging leaders need to understand and navigate this new cybernetic and learn and experience the science of connectivity and networked learning. Tenacious legacies such as hierarchical organisations, transactional management, selective recruitment, and succession rites that have been around since the 1900s and instigate incongruous superhero and command/control leadership behaviours need to buried. If we are to truly transform our leadership into a swarm model, there needs to be a concerted rethink in the way we design and connect our organisations. Future information and data needs to pass through leaders, not to them.[29]

Networked Learning Organisation

We briefly looked at the learning organisation in Chap. 3. In 1973, Donald Schön, following on from his 1970 Reith Lectures, wrote about learning systems:

> We must become able not only to transform our institutions, in response to changing situations and requirements; we must invent and develop institutions which are 'learning systems', that is to say, systems capable of bringing about their own continuing transformation.[30]

These words were written prior to the World Wide Web and the digitally connected organisation. Senge took up the idea of learning organisations (again prior to the rapid spread of the internet) where the cognitively reframed individual becomes a change agent within the broader organisation. David Bohm writes in his seminal text, *On Dialogue*, 'It's not enough merely for one person to change his representation … real change is the change of collective representations.'[31] The World Wide Web, digital collaborative tools, and networks have changed the pace of organisational learning where senior leaders can communicate beliefs, ideas, and experiences in a single click through emails, webinars, and blogs. The 2018 Digital Business Report describes the new organisational learning as one that is carried out through 'experimentation and iteration'.[32]

We saw in Chap. 5 that companies are increasingly using digital tools to connect and collaborate with each other. The collaborative network, with its collective thinking and shared problem-solving feels very much like the once vaguely defined learning organisation is really coming of (digital) age.

Connectivism has come into being with the rise of the internet. Connectivism is a modern pillar of learning that supports serendipity, experimentation, open collaboration, and networked learning—the key ingredients to create a modern swarm business.

Education and Culture Programmes

The idea of using formal education to broaden attitude and thinking and steer emerging leaders towards collaborative and responsive leadership has not been debunked; rather, leadership development and behavioural change in the future will be part of a broader (triadic) leadership development system. Educational and culture programmes relating to the new structures and networks and collaborative approaches should span across the organisation. We saw in Chap. 4 that Zappos runs culture camps for its employees to raise their awareness of Holacracy. Many of the tools and approaches in Chap. 6 are about building a digital and collaborative mindset that employs self-directed learning and networked and technology-based learning. The idea of teaching culture and collaborative behaviours in PowerPoint slides in classrooms should be buried as we move towards technology-based learning, networked learning, and digital factories. Organisations need to urgently review their educational programmes and reallocate resources that are being sunk into programmatic holes and start investing in technology-based alternatives and self-directed platforms.

Recruitment and Redundancies

Organisations will need to rethink how the enterprise is staffed and resourced in preparation for Industry 4.0. As the organisation moves into gear 2 and the merging of silos and departments, there may be roles that become naturally redundant and the organisation will likely have to go through some form of redundancy programme.

There will also be some workers who may not wish to work in an open collaborative ecosystem, preferring centralised structures and traditional reporting lines. These workers will need to be identified and offered choices. If it is felt that culture and awareness programmes will not shift their working preference, then the organisation may need to consider letting them go with a severance package. Zappos faced this challenge when converting to Holacracy.

As we saw in Chap. 4, CEO Tony Hsieh wrote a memo to all staff outlining the new approach and offering a company-wide severance package for those who felt the new approach was not right for them;[33] 260 (18% of the company) decided to take the offer and quit.

As the enterprise moves towards collaborative networks, there will also be more opportunities opening up for non-traditional resources such as cloud working,[34] freelancing, and professionally paid 'solver networks'.[35] The use of AI and machine intelligence, collaborative communities, and contract workers will mean that organisations of the future will be leaner. There will need to be a decisive mindset shift from 'size matters' to 'collaboration matters'.

Changes will be needed at the recruitment level. We are already seeing a global talent pool emerging via such sites as LinkedIn. Linda Graton writes in *The Shift*, 'Around the world, outdated hierarchies will crumble; notions of nine-to-five working will come under immense pressure; and those who in the past would have been disadvantaged will have the opportunity to join the global talent pool.'[36] One of the major shifts that will need to take place in the swarm enterprise is an attitudinal shift in recruiting more diverse leaders. Dov Frohman and Robert Howard explore this in *Leadership the Hard Way: Why Leadership Can't Be Taught and How You Can Learn It Anyway:*

> Leaders are found in the strangest places. Often the best candidates turn out to be people from outside the mainstream—the misfits, the critics, sometimes even the naysayers—who at first glance one would never expect would have leadership potential. So be prepared to look for new leaders in unexpected places and to give them the opportunity they need to bootstrap their own learning.[37]

Leaders need to be recruited from a global talent pool and spared the succession rite culture that grooms them as managers.

All of this points to a different kind of recruitment that is based on talent, creativity, and innovation rather than succession rite, class, and demography. Klaus Schwab refers to this as the shift from capitalism to talentism.[38]

We have already explored some specific recruitment needs in this chapter. Organisations should think about recruiting a temporary chief digital officer to oversee the transition and beef up 'data leadership'.[39] There should also be an active recruitment drive to build digital quotient among mid-level talent.[40] Chief Information Officers will also need to be more hybrid:

> Companies will seek 'hybrid' CIOs who have not only business savvy but also experience with analytics, organizational design, and infrastructure—and who know how to wire together a holistic system that can support global growth.[41]

This final chapter concludes a study that has been pushing for organisations to approach leadership and LD in a different way that scraps its obsession with training mindsets through classrooms and influence-based categorisation tools, towards a whole systems approach that develops the entire leadership ecosystem (the 'fishpond'). Transformational leadership has been in progress for nearly 40 years, but IR4 is creating a new sense of urgency. This chapter proposed a fast and practical two-speed approach to change which focuses on eradicating conditioning structures, creating swarms and collaborative networks, merging divisions, and managing resources.

In a LinkedIn article entitled "Digital disruption has only just begun", Pierre Nanterme, CEO of Accenture, provides this chilling fact, 'New digital business models are the principal reason why just over half of the names of companies on the Fortune 500 have disappeared since the year 2000.'[42] The fourth industrial revolution is upon us and organisations must act now to future-proof their organisations and avoid becoming another VUCA victim.

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Epilogue

This book has been exploring the future of business leadership development. The days of the leader as an influencer of people and systems is wearing thin. We are in the throes of a fourth industrial revolution that is going to have a profound impact on organisational structure and leadership. The immediate future will see more networked organisations, connected stakeholders, customer communities, data-ism, and machine intelligence in our organisational lives. Leaders will need to shift away from old assumptions of positional power and the belief that they are the centre of cognitive excellence and execution to the acceptance of the idea that organisations of the future will be more open and that innovation and decision-making will come through networked communities of internal and external agents assisted by artificial intelligence and digital tools. The leader's role in this hyperconnected and collaborative space is as a responsive connector who cultivates and choreographs networked learning across communities of people and machines. The leadership of tomorrow is going to look and feel very different—this is captured in Table E.1

The reality is, despite decentralisation, organisations continue to barricade themselves against the outside world. With the advance of IR4, however, it is imperative that organisations and their leaders connect and collaborate with the outside. The rise of connectivity, robotics, AI and machine intelligence, data-ism, biotechnology, and alternative transportation is transforming consumer behaviour and organisations need to change their structures, networks, mindsets, and leadership models. The end game is a connected and collaborative enterprise and a more responsive leadership based on the principles of

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Table E.1 Leadership 4.0: a shifting story of structure, connections, and leadership mindsets

	From….	To…
Structure	Egosystem	Ecosystem
	Mechanical	Organic
	Building organisations	Building networks
	Strategy by design	Strategy by discovery
	Learning organisation	Learning system
	Conditioned	Open
Connection	Leading through organisational structures	Leading through networks
	Fixed hierarchies	Collaborative networks
	Central innovation and decision making	Open collaboration and sensemaking
	Internal focus	External focus
	Director	Connector
Mindset	Centralised knowledge and decision making	Collective knowledge and decision making
	Analogue mindset	Digital mindset
	Fixed intelligence	Swarm/Multiple intelligences
	Sovereign	Responsive
	Dependency	Readiness

swarm intelligence rather than the heroic model of leadership that's been with us since the first industrial revolution.

This book has used elephants, bees, ants, mice, termites, and fish to explore how we can prepare our leaders for this new reality. It promotes a whole systems approach to developing leaders where leadership development is no longer a contained and processed activity, but a vertical and systems-wide development. It requires us to throw out tenacious organisational legacies that are fuelled by out-of-date learning theories and recruitment practices. We need to adopt a more holistic approach to developing leaders and ditch costly one-off classroom training programmes in preference for technology-based and continuous networked learning, channelled through learning systems that are personalised and self-directing.

Organisations need to act fast. The fourth industrial revolution is in motion and companies have already been swept under its wave with the rise of consumer voice and volatile environments. Those of us who work in the leadership development arena know that it takes time to develop future leaders and most of us know in our hearts, if not our minds, that despite all the money we are throwing at it, the current way of developing leaders is not working and is not fit for purpose for Industry 4.0. Some early adopters are already transitioning into swarm businesses and ripping away their structures and linking with the outside through collaborative networks. It is time for all organisations to wake up to the reality of IR4 and join the swarm.

I would like to end on a personal note. As I scan through the final manuscript, feeling a sense of achievement that this intense two-year project is

drawing to a full stop, something occurs to me that I didn't dwell on during the writing of the book. This book is controversial. Leadership development is a global industry worth over 50 billion dollars a year, employing a large percentage of people around the world including company workers, consultants, researchers, authors, academics, software developers, event organisers, and all the staff in hotels and conference facilities associated with hosting residential leadership programmes, and here I am writing its obituary. I hope, however, that the book is seen as something constructive and positive. I have used swarm theory and systems thinking to point to a future where leadership will be less superhuman and leadership development will be more self-directing and more broadly developed by ecosystems and collaborative networks. Organisational decision-makers need to prepare for this scenario and I hope this book contributes to that journey.

Glossary of Terms Used

360-degree feedback A process of collecting feedback from multiple sources.

3D jobs Low-skilled jobs seen as 'dirty dangerous and demeaning'.

3D printing Creating a physical product from a digital design.

AI algorithms A set of instructions given to an AI programme to help it learn on its own.

Algorithms A set of steps to accomplish a task. A computer algorithm is a set of steps that allows a computer to solve a problem.

Analytics The information resulting from data-ism used to gain knowledge, improve or change business processes, and drive business success.

Andragogy A term coined by Malcolm Knowles relating to adult learning.

Artificial intelligence The simulation of human intelligence demonstrated by machines.

Augmented reality The physical world is 'augmented' by computer-generated environments.

Behaviourism A dominant theory in the 1940s which posited that we do not have innate and predetermined behavioural traits but are conditioned by our environment.

Big data Large complex data sets. Big data analytics is the investigation of these large data sets to determine useful information.

Biochips A microchip that tests, analyses, and transmits human chemical reactions.

Biometrics Measurement of physical and behavioural human characteristics.

Biotech trash converters A device that converts waste to common household chemicals.

Biotechnology Technology that uses living organisms to generate products, medicines, and consumables.

Blended learning Blends traditional classroom delivery with online digital media.

Brain uploading Mapping the brain connectome and uploading it to a computer.

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Care-o-bots A service robot that cares for humans.

Centralised (closed) structures A fixed organisational structure where decisions are made at the top.

Centralised networks A fixed and prescribed network which reinforces ego and positional power.

Charismatic authority Term used by Max Weber signifying someone with exceptional powers or qualities.

Classic conditioning A learned response through association of stimuli.

Cloud analytics Data analysis using cloud computing.

Cloud computing Data storage on a remote server or network.

Cloudworking Virtually connected people who work for organisations through online bidding of tasks.

Cognitive constructivism See Constructivism.

Cognitive reframing To consciously change entrenched mindsets, habits, and attitudes through mental reconfiguration.

Cognitivism A dominant theory in the 1950s that posited behaviours and performance are improved through inner rationalisation.

CoIN A term devised by Peter Gloor meaning collaborative innovation networks. See Collaborative networks.

Collaborative intelligence (CQ) A term coined by William Isaacs relating to the ability to build, contribute, and manage the power and energy found in networks of people.

Collaborative networks Cross-functional networks that span inside and outside the enterprise by producing collective innovation and decision-making.

Collective thinking Drawing on group knowledge, perspective, and intuition.

Competency based education and training (CBET) A focus on learning objectives and outcomes.

Complex adaptive system A complex system that has an undercurrent emergence rather than top-down order.

Complexity theory A theory that helps build understanding of uncertainty and seeks to uncover special traits within complex systems where seemingly independent agents spontaneously form coherent systems.

Connectivism A theory that was influential in early 2000, positing that knowledge is networked and adaptive.

Connectors (networks) A term used by Malcolm Gladwell to mean people who get things done through others via building trusting relationships and 'gluing' connections together.

Conscious competence See Four stages of learning

Conscious incompetence See Four stages of learning

Constructivism A dominant theory in the 1960s which posited that reality is subjective and that knowledge and meaning are actively built/constructed through internal (cognitive) or social negotiation.

Crowd-voting See crowdsourcing.

Crowdsourcing Gathering information from a large source of people to achieve a common goal usually through crowd voting and collaborative filtering.

Cybernetics A transdisciplinary approach for studying self-regulatory systems

Cynefin framework A framework that helps sensemakers understand the level of complexity of a given situation in order to select the right interventionist strategy.

Data mining The examination of large sets of data to gain new insights.

Data science Interdisciplinary study looking at origins, storage, analysis, and interpretation of structured and unstructured data for the purpose of decision-making.

Data-ism To aggregate and mine huge data sets called 'big data'.

Digital factory A networked swarm, squad, or scrum that operates outside of the conventions and rules of the company on issues that will advance the enterprise.

Digital quotient Measurement by McKinsey and Company relating to the digital maturity of an individual or organisation.

Digital sickness See Information sickness.

Digital storytelling The use of digital medium to tell a story.

Distributed networks An open network that has no formal or prescribed nodes.

Dotocracy A form of collaborative voting.

Drones A pilotless craft operated by remote control or onboard computers.

eCoaching Coaching through the electronic medium.

Ecosystems An interconnected system.

Egocentric networks A fixed and prescribed network which reinforces ego and positional power.

Egocentric structures A fixed and central organisational structure where decisions are made by a handful of people.

Existential intelligence See Multiple intelligences.

Facial recognition Biometric software that maps facial features and stores them as a faceprint.

First order cybernetics Observed systems or mechanisms in engineered systems, mechanics, computers, and artificial intelligence that is not associated with cognition.

Four stages of learning Classic study on learning motivation involving conscious and unconscious states.

Fourth industrial revolution A term popularised by Klaus Swarb of World Economic Forum to signal a range of new technologies that will impact economic, business, and social life.

Frame reflection A term coined by Donald A. Schön to forcibly look at alternative scenarios or to see situations from the point of view of somebody else.

Gig economy Short-term and freelance work as opposed to a permanent job.

Hive mind A term coined by Louis Rosenberg to signify collective thinking.

Holacracy A term coined by Brian Robertson meaning a self-organising part (or holon) in a broader whole that acts interdependently.

Horizontal development Prescriptive lateral growth through replication, habitual transmission, and reinforced structures.

Hot-desking Desk sharing. A term borrowed from hot-bunking where submariners shared their bunks.

Hub and spoke network A network with a central hub like a bicycle wheel.

Human-computer interaction The way people interact with computers.

Hyperconnectivity Mass interaction of people and machines.

Hyperloop One A future transport system using vacuum tubes and electromagnetic levitation.

Iceberg model A model attributed to Daniel Kim that helps us to look beyond surface events to underlying causes.

Infographic A portmanteau of information and graphic. A pictorial representation of an idea.

Informal network A network that is not part of a formal organisational structure.

Information sickness Information overload causing sickness.

Information transparency The open and clear presentation of information.

Instant skilling Downloading knowledge and skills direct to the brain.

Internet of things (IOT) Interrelated and connected computer devices.

Interpersonal intelligence See Multiple intelligences.

Intersectionality See Medici effect.

IR4 See Fourth industrial revolution.

Kaizen Japanese word for continuous improvement or change for the better.

Kanban Japanese word for a visual signal or card that is used as a workflow management tool.

Ladder of inference A self-awareness tool that helps to suspend assumptions and act on observable data.

Leadership ecosystem The whole system in which leaders lead.

Learning management systems A central online hub that contains all information relating to leadership and LD.

Linguistic-verbal See Multiple intelligences.

Logical-mathematical See Multiple intelligences.

Machine intelligence A machine that interacts with its environment in an intelligent way.

Machine learning Unsupervised algorithms that arrive at conclusions through deep learning and automated analytics without human supervision.

Management cybernetics A self-regulating and self-organising management system.

Matrix organisation An organisational structure characterised by multiple command systems set up as a grid rather than a traditional hierarchy.

Medici effect A phrase coined by Frans Johansson referring to the fourteenth-century Italian Medici dynasty that championed diversity and intersectional thinking.

Mental models The way we perceive and see the world, our fixed mindset.

Metalearning Encouraging learners to reflect on how they learn.

Mixed reality A hybrid of real and virtual worlds.

Multiple intelligences A term coined by Howard Gardner to signify a group of intelligences beyond cognitive.

Musical-rhythmic See Multiple intelligences.

Nanobiotics Molecular robots.

Nanobots A microscopic walking robot created by Lula Qian.

Navigationalism A theory by Tom H. Brown that explores how learners seek and use information as a learning process particularly in network environments.

Neo-Luddism Rise in technological resentfulness.

Network A set of relationships that have nodes (person group or object) and ties (a connection).

Network effect Where an increase in users improves the value of a good or service.

Network nodes See Networks.

Network perspective Someone with an ability to understand, in a strategic way, the relationships and dynamics in networks.

Network ties See Networks.

Neurostimulation A developing technology that stimulates the brain to develop new skills.

Open innovation A term first coined by Henry Chesbrough in which companies need to look externally for research and development of their product/services using digital platforms and tools.

Operant conditioning Behaviour that is determined by consequences.

Organisational sensemaking See Sensemaking.

Parallel universe syndrome Where learners who have been on residential learning programmes go back to work and quickly revert to old habits.

Patriarchal organisation Patriarchy comes from the Greek meaning rule of the father and relates to a single male ruler.

Personal mastery Continued self-improvement.

Pharmacogenomics The response to pharmaceuticals at the gene level.

Platform economy Economic and social activity that depends on platforms such as the internet to operate.

Processed leaders Leaders who develop and advance through strict programmatic means.

Prosumer Someone who consumes what they produce.

Responsive leadership A theme at the 2017 World Economic Forum theme at Davos. It literally means to respond to situations in an intentionally adaptive way.

Rigelmann effect An observation relating to the decrease of individual effort in teams.

Robotics A field of technology to do with the design, build, operation, and application of robots.

Sage on the stage Classroom instructor.

Scenario planning A structured story format that hypothesises future projected scenarios and the impact they will have on current organisational reality.

Scientific management A management theory that analyses and synthesises workflows.

Scrum See Digital factory.

Second order cybernetics Observed systems or mechanisms residing principally in biological systems and living organisms.

Self-management Functioning in the workplace with little or no supervision.

Self-organising systems A system which changes its basic structure as a result of environmental factors.

Self-adaptive system A system that evaluates its own behaviour and changes its own direction.

Self-directed learning An autodidactic approach to learning where the learner is self-motivated and learns without formal instruction.

Sensemaking Based on abductive logic, sensemaking recognises cognitive limitations, and approaches ideas without preconceived reality, status, personality, or a temptation to solve things.

Shared economy Known as collaborative consumption; this is where consumers rent and borrow rather than own.

Situationism A theory that posits situations influence behaviour.

Social constructivism See Constructivism.

Social learning Learning that takes place in a social context.

Social Network Analysis (SNA) The study of social networks where the network is mapped and measured and roles, groupings, relationships, and information flows are identified.

Solver networks An open collaborative network that solves challenges.

Stimulus-response theory A theory that posits behaviour comes from the interplay between stimulus and response.

Strategic business unit (SBU) A unit of the business that operates as an independent entity, with its own strategic vision, direction, and supporting functions, but falls under the profit centre of the parent enterprise.

Succession rite Processed leaders are identified, nurtured, and promoted by the organisation as a matter of formality.

Superorganisms A colony of eusocial animals who act as a single organism for the benefit of the group.

Swarm intelligence A theory that flocks, swarms, shoals, colonies, and humans, behave more intelligently as a collective rather than as an individual species.

Swarm leadership An adaptive, emergent, connected, responsive, and collaborative model that belongs broadly in the category of collective leadership.

Swarm organisation A complex adaptive system that is networked and structured for open collaboration where self-organising agents swarm down on a challenge.

Swarms See Digital factory.

Technology-based learning Any form of learning delivered via the electronic medium.

Telemetry The wireless transmission and measurement of data from remote sources.

Total quality management An organisational-wide effort for continuous improvement.

Transactional leadership Leadership that focuses on supervision and performance often using stimulus-response methods.

Transformational leadership A leadership style that focuses on improving followship.

Transhumanism The enhancement of human intellect and physiology through the use of technology.

Transmission-based learning Formal lecturing (normally in a classroom environment).

Unconscious competence See Four stages of learning.

Unconscious incompetence See Four stages of learning.

Universal basic income People who are given a basic amount of money to survive that isn't tied to any conditions.

Vertical development Development that is not dependent on the organisational input but is systems based and increases growth, maturity, and perspective.

Virtual reality Computer-generated simulation of an external environment.

Visual-spatial See Multiple intelligences.

Voice recognition Computer analysis of human voice.

Waggle dance A figure-eight dance used by bees in communication identified by Nobel laureate Karl von Frisch.

Wearables Technologies with digital sensors that can be worn on the body.

Wireacracy A theory by Jon Husband that is an organising principle for complex ecosystems.

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