



SCHOOL OF  
ECONOMICS AND  
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# Unravelling the Complexity Puzzle: Evaluating the Relevance of Traditional Change Management Models in a Complex Environment

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# ABSTRACT

Traditional change management models have been widely used to manage organisational change. However, this integrative literature review paper questions their relevance in environments characterised by complexity due to the intricate nature of challenges and uncertainties in these contexts. A novel framework is developed, encompassing key elements required to facilitate change in complex environments. The proposed framework emphasises the importance of innovation, adaptability, collaboration and openness, action-orientation as well as reflection and observation as crucial components. To validate the framework, the study applies it to the integrative literature review of three traditional change management models: Lewin's three-step model, Kotter's eight-step model and the ADKAR model. The analysis revealed that none of the included models fully meet the criteria for facilitating change in complex environments, as they all lacked an element of adaptability. Among the evaluated models, the ADKAR model demonstrates the highest level of relevance as it fulfils the other four criteria in the framework. The study concludes by suggesting that organisations operating in complex environments make use of traditional change management models with caution and that our framework could be used as complementary to them. Although further research is needed to evaluate the relevance of more contemporary change management models, this paper serves as a valuable resource for practitioners and scholars seeking to navigate change within complexity effectively.

**Keywords: change management, complexity, Lewin's three-step model of change , Kotter's eight-step model, ADKAR, traditional change management models, complex environment**

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# 1. INTRODUCTION

## 1.1. Background

The 21st century has become a space in time more characterised by complexity than ever before (Karp & Helgö, 2009). Rapid change, high uncertainty and the prevalence of wicked problems have affected all parts of society, no less the business industry and organisations globally. The world is also becoming increasingly interconnected. Viña and Liu (2022) argue that this interconnectivity can be associated and linked to many aspects of our changing environment, including the increased exchange of goods, services, and materials, an increased flow of information, and the increased movement of people across borders. The world has become a global supply chain (Viña and Liu, 2022). In order to face these challenges, organisations can turn to the field of change management as it is aimed at guiding managers in different ways to approach change.

Change management is of interest to many stakeholders within a business, but also to scholars and consultants. Change management can be defined as “a set of processes, tools and practices that are used to manage the people side of change” (Al-Alawi, Abdulmohsen, Al-Malki & Mehrotra, 2019, p.115). It also refers to “an area of professional practice and the related body of knowledge that has grown up within and around this subject” (Balassanian, 2007, cited in Al-Alawi et al., 2019). Many different change management models have been created to guide and steer a change process. Each of these models outlines an approach to implementing change, an approach which the model’s creator argues will result in its successful implementation. However, the complexity of our world adds additional difficulties to a process which can already be challenging. Complexity is characterised by non-linear interaction, no right answers, unknown unknowns, a high degree of uncertainty, and a difficulty with making predictions (Snowden and Boone, 2007). Managing change and guiding a change process can be made more difficult when operating within a complex environment. As a complex environment is a term we will be referring to throughout our paper, it is helpful to distinguish what we mean by it. Essentially a complex environment is a place characterised by the complexity that we defined above. More



specifically, we view complex environments as characterised by unpredictability, interconnectivity, rapid change and uncertainty.

As we become more aware that complexity is a part of the new normal, the question arises: Are traditional change management models that have guided managers for decades still relevant in a complex landscape? This question led us to realise the need to evaluate conventional change management practices based on the demands of a complex environment. Within the frame of this study, we do not intend to provide alternative approaches to change with regards to complexity. Instead, we focus on the evaluation of traditional models to reach a conclusion on the extent of their relevance. We hope to contribute to the field of management by providing a critical perspective, with the aim of guiding managers in their search for tools to deal with change within complexity.

## 1.2. The need for this research and development of a new framework

During our time of study, we were introduced to both complexity and change management, topics which were both of great interest to us. This interest inspired an initial conversation surrounding how complexity and change management interacted with one another as complex environments become increasingly apparent in our lives. Kotter (1997) highlighted this increased interaction stating,

If anything, with the globalisation of the economy and the accompanying technological shifts, the business environment is going to speed up even more. If that is true, the “change problem” will get bigger, and those who try to handle it in the old-fashioned, managing-change way are going to be left behind in the dust (p.19).

Hence, the idea for an initial search into complexity and traditional change management as interactive parts was conceived. As both complexity and change management are widely studied and discussed academically and professionally, we expected a substantial body of work and research to be available to us. However, this was not the case. As our search widened and

deepened, we struggled to find an answer or a guide to navigating change management in a complex environment. The quest for this answer spurred the motivation to take this further. Sidorko (2008) stated that “for managers/leaders wishing to use a change model to facilitate their change process, the first obstacle lies in selecting a model from the plethora that is available and that is appropriate to their needs” (p.308). Throughout our search we looked for a guide or framework to aid our research on the use of traditional change management models in a complex environment, however, this was to no avail. From this, an idea was born; we saw the need for a guiding framework which would aid change agents in choosing a suitable change management model in the face of complexity. This study will build upon existing research on change management to provide an overview of traditional change management models. It will also build on existing research on complexity and change in order to create a framework. This framework will then be put to work as we apply it to existing change management models to demonstrate both the usefulness and importance of such a framework in our increasingly complex world.

### 1.3. Aim of the study

The world we live in is complex and has become increasingly more so as we have become increasingly interconnected (Viña and Liu, 2022). Change management models are frequently reliant on a sequential design and meant to be followed accordingly to implement change successfully. However, these may not be equipped for complex situations which may interrupt that process. With this study, we aim to develop a framework based on our extensive research on complexity. The reason for developing this framework will be to evaluate change management models for aspects which we argue are necessary for navigating complex environments.

### 1.4. Purpose

The purpose of this study is to determine the relevance of traditional change management models in an increasingly complex environment. This relevance will be determined by implementing our newly developed framework, which outlines the necessary components for navigating change in a complex environment. This framework has been designed to guide change makers and facilitators in choosing a particular change model or considerations they should make before implementing such a process. This leads us to our research question:

- Are traditional change management models still relevant in a complex environment?

## 1.5. Delimitations

As with any study, it is essential that our research is framed by a clearly defined scope and set of boundaries. These scope and boundaries define the delimitations of our study. Change management is both widely studied and practised. For this reason, it would not be possible for us to study all aspects of change management, so an intentional decision was made to focus on a particular aspect that was of interest to us and a gap in existing research was identified. Our chosen area of research focuses explicitly on complexity and traditional change management models. This highlights the two major decisions we made regarding the boundaries of our research area.

The first delimitation of our paper relates to our decision to focus only on change management in the face of complexity when it may be argued that there are many environments in which change may need to be implemented. As previously outlined, it is widely recognised that our world is becoming increasingly more complex, which can have a major impact on change processes. Therefore, this creates a sense of importance in understanding and approaching complex environments. The importance and impact of complexity can be understood through the wide range of research. Complexity is included as one of the four elements of VUCA (volatile, uncertain, complex and ambiguous). It is also included in the four components of the Cynefin framework (simple, complicated, complex and chaotic). Furthermore, complexity has also been the basis for an entire area of research, leading to the development of complexity theory. As we began our preliminary research, it became apparent that an analysis of change management models, or an analytical tool to help analysis, was lacking in existing research. This gap in the research, combined with the relevance of complexity as a field of study, encouraged us to limit the scope of our study to complexity.

The second delimitation of our study is the choice to focus on traditional change management models. We have chosen three models; Lewin's three-step model of change, Kotter's eight-step model of change, and the ADKAR model. As previously stated, we were interested in the

concept of complexity in relation to change management. There is a wide range of change management models available for use by change agents and studies for scholars. However, these models have all been created at different times. Due to the rise in complex environments, as previously discussed, we were interested in how older models for change management could be relevant in a world that was more complex than when they were created. Pregmark (2022) stated, “data points toward that older methods and models for working with major change have challenges in a context, where the future is uncertain, and the magnitude of the required changes is greater.” This point further confirmed our choice to intentionally limit the scope of our research to these more traditional models of change.

## 1.6. Outline of the thesis

This thesis has three primary components; the development of a new framework, a literature review of traditional change management models, and the application of the framework to these traditional models.

The paper will begin in Chapter 2 with an overview of our methodological approach, outlining our considerations and argumentation for our chosen approach, the quality of our paper, and the limitations of our research.

Following this, Chapter 3 will move on to developing and discussing our framework. This chapter will begin with a more in-depth discussion of our methodological approach, followed by an introduction and presentation to the fully developed framework, supported by a discussion on each component. The chapter will conclude with a critical discussion of the framework.

Chapter 4 is the introduction to our chosen traditional change management models. It will also begin with a more in-depth discussion of our methodology. Our three chosen models will be discussed under the heading’s Outline of the Model, Assumptions of the Model, and Strengths and Weaknesses.

In Chapter 5, we will apply our newly developed framework to each of our previously outlined change management models. This will be done to determine the relevance of each model, and will also serve as a demonstration on how we intend the framework to be used.

The thesis will end in Chapter 6 with a discussion and conclusion. Here we will summarise our findings and application of our framework. This will lead to an evaluation of the framework. The implications and possible areas of future research regarding our research will also be discussed.

## 2. METHODOLOGY OVERVIEW

### 2.1. Research approach

The purpose of our study is to evaluate the relevance of traditional change management models in a complex environment. In order to fulfil this purpose, we needed to:

1. Create our own framework of what is needed to facilitate change in a complex environment (Chapter 3)
2. Get an overview and a deeper understanding of traditional change management models (Chapter 4)
3. Use the framework we created to evaluate their relevance in a complex environment (Chapter 5)

In order to fulfil step 1 and 2 we decided to conduct an integrative literature review where we analysed available literature on complexity and change, as well as the available literature on traditional models (the details of the methodology of each literature review will be discussed in Chapter 3 and Chapter 4). Other possible research methods, such as observations and interviews, were considered but ultimately excluded due to the nature of the phenomenon of change and its inherent research limitations as well as the limiting factor of interviewee bias. It would have been difficult to observe the implementation of traditional change management models and evaluate their relevance because change initiatives are time-consuming and would likely not be finished within the ten-week time frame that this thesis was limited to. Furthermore, if we wanted to interview change management consultants on how relevant they perceive traditional change management models to be when implementing change initiatives, we would also need to consider their potential bias. This may be evident not only in their memory recall of their experience, but also in the sense that there is a risk that change management consultants tend to make use of their own or their company's constructed models as that is part of the service that they are selling.

The integrative literature review was chosen as the most appropriate research approach because it allowed for the research to incorporate multiple and diverse findings and conclusions based on

empirical and non-empirical data that would not have been possible to conduct ourselves due to our time and resource limitations (Snyder, 2019). During the initial stages of the research we made general preliminary searches to get an overview of the area of interest. This suggested that there was enough research available in order to conduct a valuable and interesting literature review with integration and synthesis of literature, but not enough for the area to appear saturated or over-researched (Palmatier, Houston & Hulland, 2017; Green, Johnson & Adams, 2006). This preliminary search also indicated that there was no existing body of research that had already investigated the topic of this thesis (Green, Johnson & Adams, 2006).

In addition, integrative literature reviews tend to be structured either by a guiding theory, a collection of competing models or based on a specific perspective on the topic (Torraco, 2005). In the case of this thesis, we were interested in the extent to which traditional change management models are relevant in a complex world. Inherent in our research question and query is the perspective of complexity, which is why we needed a framework that could serve as a guidance when evaluating the models in relation to how relevant they are in a complex environment. While conducting our research we found no framework that fit this need, which led us to create our own. The process of creating the complexity framework will be discussed in more detail in Chapter 3. After we created the framework of complexity, we implemented it on the chosen traditional change management models by comparing the criteria of the framework against the knowledge gathered on the models. By applying the framework of complexity on the findings of the literature review, we are able to not only evaluate the relevance of traditional change management models in a complex world but also to test the validity of our own framework. To further increase the validity and applicability of our framework, more research where the framework is used will need to be conducted.

## 2.2. Research quality

The quality of this research can be assessed based on its validity, replicability, and usability. The study aims to reach a high level of validity by only including peer-reviewed articles but still using available and well-recognised databases to find a sample that is representative of the body of research on the topic. The study should be easy to replicate as the process for how the research

was carried out has been documented in detail. This paper is also highly useful not only because it provides a critical overview of change management models in relation to complexity but because it provides a recommended framework for how to assess the relevance of change management models. This can be useful not only for researchers but also for practicing managers looking to employ a change management model.

### 2.3. Limitations

As with any academic research there are a number of limitations, and the present study is no exception. Firstly, we are restricted in the amount of articles that we have access to by our university library's resources. This means that there is a risk that our search unwillingly missed a number of articles that could have provided valuable insight on the topic and might have been relevant to include in our final sample. To combat this limitation we would in some instances find available versions through a Google search or ask for a full-text PDF by the original author. Secondly, the contribution and value of this study is largely dependent on our individual ability to make sense, integrate and synthesise complex abstractions of ideas and concepts from a variety of articles. We are no experts on the field and are very humble to our limited ability in making insightful and analytical integrations of the research, as well as being able to report on them in a clear way. In order to maintain a high level of analytical ability, we have been working collaboratively for the majority of the process, to allow for critical discussion of our own ideas and conclusions and to be able to challenge one another. We are aware of the risk for group think and actively try to challenge each other's ideas. Lastly, we as researchers need to be aware of our inherent bias and the effect we have on the research conducted. When we were selecting articles during the data collection process, we were not immune to the effects of both sampling bias and confirmation bias. A strategy we used in this process was to document all the reasons for why we excluded individual papers, which not only helped us to document on our exclusion criteria but it also contributed to a decrease in our bias since there had to be a legitimate reason for why each article was included or excluded.



## 3. FRAMEWORK

### 3.1. Method

#### Research design

While conducting our research, we found no framework that could make an assessment on the relevance of change management models in regards to their ability to facilitate change in a complex environment, which led us to create our own. With no previous experience in creating a framework, we turned to literature to act as a guide but also to provide us with the knowledge base and empirical data of which we could build the framework on. We decided to do a database search on the words “complexity” and “change management” in order to find relevant research that approached the bridge between these two concepts. This gave us a total of 387 articles, but after careful consideration, we were able to decrease this number to 17 relevant peer-reviewed articles. We also searched on Harvard Business Review using the keyword “complexity”, which led us to three relevant articles and on managing within complexity. The details of how we collected the data which we built our framework on will be described in the next section. An overview of which studies were used for each concept of the framework can be found in Appendix A.

#### Data collection method

Multiple databases were used to gain material to build our framework on to ensure a broad and representative sample of studies to pull findings from. The databases included in the search were Scopus and Business Source Complete. These databases were chosen for their worldwide recognition and credibility. Our study is also limited by the databases which we are able to access. These databases are supported by our institution and meet the standard of available educational content for our university. Below we present an overview of the search words and the initial results yielded. The same search was carried out on each database. However, the limiting filters varied depending on the options available on each database. We limited our search to only articles available in English, listed as ‘limited to’ below. The only time this filter was not applied was when the option was not available as all results shown through our search words were written in English. Each database was not specifically aimed at business only data, so in most cases we limited the search to business and management journals only. The reason for this

was that we found that an extended search produced irrelevant material from other disciplines such as medicine and nursing. In the case of a database including non-peer-reviewed data, we also limited the search results to peer-reviewed only. Our search results when we built our framework looked as follows:

### Database search results

#### SCOPUS

Search words	Limited to	No. results
“complexity” AND “change management”	‘Business, management and accounting’, ‘English’, ‘Change management’	136

Table 1. SCOPUS database search results

#### BUSINESS SOURCE COMPLETE

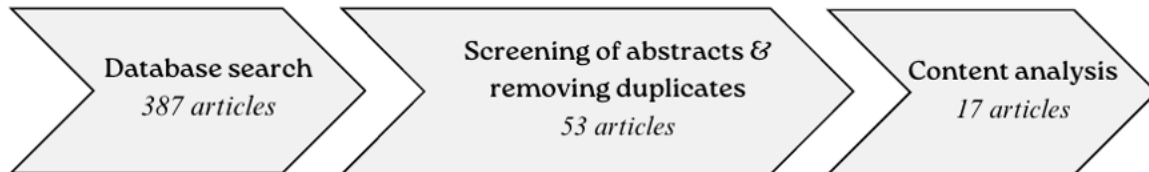
Search words	Limited to	No. results
“complexity” AND “change management”	‘Peer-reviewed’, ‘English’	251

Table 2. Business Source Complete database search results

#### Exclusion criteria

By searching for “complexity” and “change management”, we were given a total amount of 387 articles, 136 on Scopus and 251 on Business Source Complete. Due to the fact that most of these articles were not strictly relevant to our topic, an extensive exclusion process was started. At this first stage, we went through each of the abstracts of the sample and excluded articles that were either only focused on change management or complexity. We were looking specifically for articles that analysed change management models from a complexity perspective, and any article that didn’t fit that criteria was excluded. We also removed all of the duplicates that we came across. By the end of the abstract screening process we reached a sample of 53 articles. At this stage we did an even more detailed screening where we collectively went through each abstract and judged it based on our purpose. We also kept a running record of our reasons for excluding

certain articles. Common reasons for exclusion were that they defined complexity differently to us, that they focused too much on leadership, that they focused on developing their own model or that they were completely irrelevant to our topic. At the end of the second stage, we were left with a total number of 17 articles.



*Figure 1. Sequence of complexity and change management search results exclusion process*

In addition to our extensive search on Scopus and Business Source Complete, we broadened our research on complexity and change by searching through articles on Harvard Business Review, using the keyword “complexity”. This generated 815 results, which were skimmed through to find relevant articles on complexity and change. Three articles were selected through this process and they were all highly relevant to our topic.

## Data analysis method

Once we had reached the final sample of articles to include in the literature review, the content analysis started. The 20 articles were printed and divided randomly and evenly between the two of us. We each read the full articles and highlighted relevant information according to a colour system we developed for this purpose. The colour system was designed to identify three pieces of information:

- Aspects of a complex environment,
- Aspects of a person or organisation dealing with complexity
- Definitions of complexity and/or complex environments

After the articles had been read, we transferred the concepts that had emerged from the colour system into an excel file, which left us with a long list of aspects that concerned the facilitation of change in a complex environment (see Appendix B). We found that a number of these were repeated by researchers, and others were less common but still very relevant for complex situations. We then wrote down each item on a piece of post-it and put them on a board in order to better visualise each item. Then we started to group them together based on similarity, combining and expanding on categories until we felt that each item belonged with the group of items it was in. This left us with five larger groups that each consisted of at least three and maximum six items. We categorised each group according to the overarching characteristic of that defined the group and these were: innovation, adaptability, collaboration and openness, action-orientation, and reflection and observation.

## Discussion of framework method

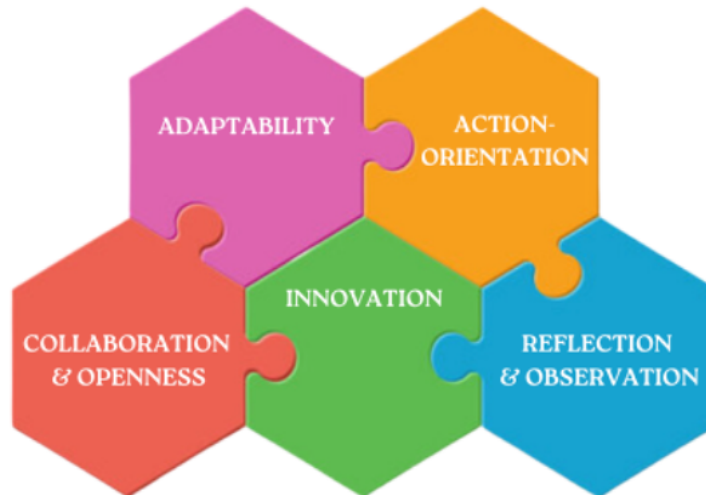
The literature that we covered in the development of our framework was comprehensive and relevant to its aim. We could have enlarged our search to include more articles in other databases, but we were limited by the access through our university. Only articles that stemmed from the original searches were included and we didn't investigate the reference lists of the articles we found. We also didn't explore relevant books on the topic or other sources of literature. Both of these options could have generated a greater sample but would also have been time-consuming and possibly more difficult to extract and compare data. We also felt that a lot of the concepts were repeated in the studies we used, suggesting some level of saturation being met.

The topic of complexity is also quite subjective, meaning that what we have gathered to be an aspect of complexity might not necessarily be the same as how someone else views it. It would have been valuable to discuss our framework for complexity with business managers or individuals dealing with complexity in their daily operations, which would have improved the level of validity of our framework and possibly provided alternative views. This was something we considered, but the process of this study was more time-consuming than we had anticipated and ultimately we decided against discussing our framework with change management professionals.

### 3.2. Presentation of framework

Through analysing articles on complexity in relation to change management, we concluded that there were five main components that needed to be present in a change model in order to effectively deal with change in a complex environment. We argue that any model attempting to address change in complex environments needs to facilitate all of the five components of our framework. These five key components are:

- Innovation
- Adaptability
- Collaboration & Openness
- Action-orientation
- Reflection & Observance



*Figure 2. The Five Pieces of Operating Within Complexity*

The components of our framework are all interconnected, which led us to the conclusion that they all need to be present in a change management model in order to be able to effectively implement change while still adhering to complexity. In order to make this clear, we chose to visualise the components using puzzle pieces that are connected to each other (see Figure 2). We

also avoided any linear or circular way of visualising the model because there is no set order or sequence in which these components need to be looked at. Instead, the model is meant to be implemented by focusing on each component in relation to the relevant change management model at hand and asking oneself the question “Does this model highlight the need for Innovation? Adaptability? Collaboration and openness? Action-orientation? Reflection and observation?”. If the change management model exemplifies all of these components, then one could draw the conclusion that the model is sufficiently able to facilitate change in a complex environment. The five components of the framework will now be presented in detail.

## The Five Pieces of Operating Within Complexity

### Innovation

Innovation as a puzzle piece to operate within complexity, particularly in the context of change, draws upon a need to create, grow or survive. Innovation within complexity requires employees and management to be curious, always asking questions, and looking for the next thing they can do or adapt to. Each environment creates its own set of opportunities and threats, and innovation can play a key role in this respect if these are looked upon not as a static certainty but as an opportunity to develop. Innovation in itself also encourages change as it drives the desire to do or create something not already done. It therefore can also act as an instigator of change.

The four aspects of innovation include:

- Non-linear thinking
- View threats and opportunities as interactive
- Promote uncertainty and open-endedness
- Prioritise learning

The concept of having *non-linear thinking* was something we came across in multiple studies that we examined for this framework (Higgs & Rowland, 2005; Straub, 2013; Kail, 2010). What is meant by this is that if a model is based on the assumption that change happens progressively and that there is a natural sequential order, then they are not looking at change as it is present today. Complex environments are characterised by discontinuous, unexpected and unpredictable

change that cannot be put into a sequence. Therefore, emphasising the need to think in non-linear terms is essential. This type of thinking is what can facilitate and lead to innovation. In order to stay relevant, organisations and individuals need to be curious about their environment and have a knowledge-searching mindset. This knowledge will then inform organisations about the needs of the external stakeholders, which will make them more able to adapt.

A second component of the concept of innovation is to be able to *view threats and opportunities as interactive* (Kail, 2010). This is about seeing threats and opportunities not as outside of one's sphere of influence, but rather that they can be actively engaged with by the organisation. This can ignite innovative thinking that can be incorporated and turned into new, innovative features of the organisation.

Leaders of change also need to be able to promote *uncertainty and open-endedness* (Uhl-Bien & Arena, 2018). Researchers found that the "role of the leader is to accept and even promote uncertainty, surprise, unknowability and open-endedness" (Uhl-Bien & Arena, 2018, p.95). If the leaders of a change initiative are open to the fact that there will be lots of uncertainties and open-endedness and make that clear to the members of the organisation, then members are more likely to raise concerns when they are not a hundred percent certain. It is important that leaders actively contribute to building a climate that is not only aware of but comfortable dealing with the concepts of uncertainty and open-endedness. They need to be able to instil confidence in their team members and make it clear that they will manage the change even if there is a high degree of uncertainty.

Lastly, leaders also need to *prioritise learning* and create conditions where learning is possible (Waddock, Meszoely, Waddell & Dentoni, 2015). If the members of the organisation are actively supported in their learning curve, they are more likely to be able to make use of new tools that are vital for the organisation to survive.

### Adaptability

Adaptability plays a central role in operating within complexity, referring to an organisation's ability to adjust to uncertain, sudden and unpredictable situations. It requires an ability to

respond without the utmost fixed structure. An adaptable organisation also requires adaptable management, employees, stakeholders and business plans and strategies. It needs flexibility and willingness to change. Adaptability calls upon not only an ability to change with changing and evolving situations but also to be resilient and able to recover from setbacks which may arise in these complex situations.

The six aspects of adaptability include:

- Agility
- Nimbleness
- Flexibility
- Dynamic capabilities
- Resilience
- Semi-structured organisation

There are several interesting aspects to consider when looking at the adaptability component of our framework, one of which is the ability of being *agile* (Chinoperekweyi, 2020). This term has gained recognition in the last decades and it stems from the ability to move swiftly, both in relation to speed and ease (Agile, n.d.). Agile development is also a method of project management that divides actions into shorter periods of work, with constant reassessment in between (Agile, n.d.). Remaining agile in the context of change management relates to the component of adaptability in the sense that it urges organisations not to get frozen into set ways of being, but to stay dynamic and fluid in order to quickly change when needed.

Similar to agility, researchers also highlight the need for *nimbleness* (Burk, 2020) and *flexibility* (Poblador, 2014). Nimbleness is defined in the frame of “implementing important changes more efficiently and effectively” than competitors of the organisation (Conno, 1998, p.9, cited in Burk, 2020). Flexibility is also highlighted as an important aspect of adaptability, as it relates to having the built in-ability to adapt to external and internal changes (Poblador, 2014).

Poblador (2014) also goes on to emphasise the need for *dynamic capabilities*. Organisations that have high dynamic capability employ non-traditional strategies in concurrence with recognised



and established strategies (Poblador, 2014). The author also argues that organisations of this type tend to be less hierarchical and that the devising of strategy tends to cripple down into different positions of the organisations. This also ties in to the idea of “loosening control”, which was suggested by Karp and Helgø (2009) as a recommendation for leaders managing change in a complex environment. The argument is that when the level of control is decreased, then there will be periods of chaos and uncertainty, which will paradoxically be beneficial as they can lead to an increase in self-governing, innovation, confusion and frustration. These components facilitate change in a complex environment (Karp & Helgø, 2009).

Another vital ingredient is *resilience* (Waddock et al., 2015), which concerns the ability to recover quickly from adversity and challenges. With resilience the authors also highlight the learning part as important to being able to respond to evolving change (Waddock et al., 2015).

Building on all of this, research also shows that a complex environment demands more *semi-structured organisations* (Uhl-Bien & Arena, 2018). Managers of these types of organisations are constantly operating between the forces of “pure chaos or pure structure”, trying not to go down the rabbit holes of either one (Brown & Eisenhardt, 1997, p.29, cited in Uhl-Bien & Arena, 2018).

### Collaboration & Openness

Collaboration and openness is important in the face of complexity to help effectively navigate an organisation and its team members through challenging and turbulent situations. In times of uncertainty it is vital that people are informed and listened to in order to increase feelings of safety and certainty. Complex environments can multiply these feelings of uncertainty to a much larger extent than environments which are not. Collaboration fosters a feeling of togetherness and shared responsibility. Complex environments may require collaboration at a higher level as they call upon a more diverse set of skills and knowledge which must work together to navigate the unknown or uncertain territory.

The four aspects of collaboration and openness include:

- Collaborative leaders

- Draw on tacit knowledge of team members
- Listen
- Diversity

In order to successfully implement change, there is a need for *collaborative leaders* (Kail, 2010). These leaders foster the idea that everyone in a team is important and actively *listen* to what their team members have to say, with no regard to hierarchy or position (Lawrence, 2015). Several studies have highlighted that people are more likely to alter their behaviour if they are being made aware of the change and offered to take an active part in it, further enhancing the importance of collaborative leaders (Karp & Helgø, 2009). With this mindset, new perspectives and important information may come to the surface, which can be vital for adaptability.

If leaders are able to focus on collaboration, then they may be able to successfully *draw on tacit knowledge of team members* (Kerber & Buono, 2005). Team members at various positions in the organisation not only have access to different pieces of information, but they are also constantly learning and building experience. If organisations can find ways to harness that tacit knowledge then they can be more adaptive and innovative. In a world characterised by high technological advancement, such as the introduction of artificial intelligence into mainstream society, it is increasingly becoming more important to rely on intuition and more implicit ways of knowing (Epstein, 2019).

Lastly, we also found that some studies who examined complexity in relation to change management highlighted the need for *diversity* (Karp & Helgø, 2009; Sullivan, 2011; Worley & Mohrman, 2014; Waddock et al., 2015). Worley & Mohrman (2014) argue that in order to deal with change in a rapidly progressing environment, organisations must draw on the diversity of their internal resources. This is because in a complex world it is becoming increasingly important for organisations as well as individuals to have range, including background, knowledge, experience and expertise (Epstein, 2019).

Action-orientation

Complex environments and scenarios require action. The existing scenario is being altered and what previously worked in favour of an organisation may now do the opposite. This requires action to be taken, often at speed and with fragmented information. Being action-orientated goes beyond thinking and strategising and instead pushes idea into action and execution, therefore proactively moving the organisation into its next phase. Being an action-oriented organisation or developing employees who are action-oriented encourages pro-activity, learning and decision-making.

The three aspects of action-orientation include:

- Envision
- Execution
- Expert execution

An important part of this framework is the ability to be oriented towards action, as even if one has the capability to adapt, there will not be much difference if the organisation does not spend time and energy to actually make the change. This was highlighted by Jaworski and Scharmer (2000, cited in Higgs and Rowland, 2005) who argued that *envision* and *execution* are two core practices for success when looking at emergent change. Envisioning is about setting a clear picture of the direction that the organisation intends to head in, even if this future state is susceptible to change in an ever-adapting organisation. Execution deals with actively engaging with the change itself, but also with the speed at which one acts towards the change. This second aspect is becoming more important as the speed at which the world, industries and organisations develop is becoming increasingly faster (Kotter, 2007). Poblador (2014) highlights not only the need for execution, but for *expert execution*. The change should be headed or at least informed by someone who has the relevant knowledge, skills and expertise. This is to ensure that the action implemented is not random, but that it is based on the available expertise.

### Reflection & Observation

Although a complex situation may pose new opportunities and challenges there can still be a lot to learn from past experiences. Therefore developing an organisation which encourages and fosters reflection and observation plays a central role in operating within complexity. Reflection

and observation can facilitate better and more informed decision-making, result in complex situations being identified or better understood early on and anticipate potential opportunities and challenges.

The four aspects of reflection and observation include:

- Reflection
- Vigilance
- Sensing
- Observing

Research has found that the components of reflection and observation are important when managing change in a complex environment (Higgs & Rowland 2005; Lawrence, 2015; Waddock et al., 2015). Lawrence (2015) highlights *reflection* in the context and moment of change, describing it as “reflection-on-action” (p.250). This shows the circularity of reflection and action, meaning that after action there should be reflection on what went well and what did not, and after reflection there should be action based on the knowledge and experience that was accumulated through reflection. This is a process that needs to be continuous (Waddock et al., 2015).

It is also important to consider the aspects of *vigilance* (Worley & Mohrman, 2014; Uhl-Bien & Arena, 2018). When being vigilant, organisations are maintaining a careful watch on the prospective dangers in their environment, so as to ensure quick action when needed.

Lastly, Jaworski and Scharmer (2000, cited in Higgs & Rowland, 2005), argue that there is a need for *sensing*, which is about transforming the observations “into emerging patterns that inform future possibilities” (Higgs & Rowland, 2005, p.125). Essentially this deals with the sensemaking of the observations made, ensuring that there is active reflection and that those reflections are being analysed and made sense of in a way that is practical and applicable to the organisation’s activities. *Observation* (Higgs & Rowland, 2005) is similar to vigilance, but with a broader sense of looking at both threats and opportunities as well as being generally aware of the state of the relevant context of the organisation.



Figure 3. Summary of Five Pieces of Operating Within Complexity Framework

### 3.3. Discussion of framework

Our framework was developed from an extensive search of complexity and change. We have identified what we argue to be a comprehensive and detailed framework for the necessary elements which must be present for a change management model to be relevant in a complex environment. However, this does not automatically verify or validify our framework. The main purpose of this framework is to determine if a change management model has the components which we believe to be necessary to be successful in a complex environment, and of particular interest for this research was its application to traditional change management models. At this time, the framework is still only a projection and has not yet been trialled for its applicability. It is possible that upon its application, we will find fault, be this great or small, with our framework. It is currently based on findings from a literature review and is not yet supported by empirical evidence.

Our framework has been designed to assess the relevance of change management models. Further along in this research, we will apply it to three models of change management. This will help us to determine if the framework is operable, and to what extent, and also if it fulfils the intentions for which it was designed. As with the development of any framework or model, there stands the possibility that it will not hold up to its intended purpose. This does not have to deem

the framework completely useless. Through the application, it may be discovered that the framework can work for a purpose different to our intention. While this means it may have failed for our initial purpose, there is the possibility of the discovery of new opportunities.

We are acutely aware that we have developed this framework based on existing knowledge and opinions of complexity. As we are aware, through our research on complexity, the world is constantly changing at a rapid pace. This also brings the possibility that the need to function within complexity may also alter. This could deem our framework obsolete, or out-moded, in such an environment.

This framework has been compiled based on our personal interpretation of the literature on complexity and the essential elements to facilitate a successful change process in a complex environment. One may argue against aspects of our model based on one's own experience or view of operating within complexity. It is also possible that personal judgement may have caused us to exclude or deem elements as not important, which one may argue otherwise.

## 4. STUDY OF TRADITIONAL MODELS

### 4.1. Method

#### Selection of models

The selection process of the models included in the literature review has been guided by the research purpose, which is to evaluate the relevance of traditional change management models in a complex environment, as well as the time and resource limitations of this thesis. In order to determine which models are considered “traditional” within the field of change management, we conducted a preliminary search both on Google but also in academic databases (Scopus, Business Source Complete, Web of Science and APA PsycInfo). The search revealed that change management is a fragmented field within management as it incorporates theory from psychology, sociology and business administration and management. There are some models referenced frequently, but there is a huge amount of lesser-known models as well. There seems to be a general inclination towards developing new models in the research. This made it difficult to navigate what could be considered traditional change management models and meant we had to spend more time trying to identify what models to include in our study.

The initial list of models that were generated through the search on Google gave us a list of eight change management models: Lewin’s change management model, McKinsey 7S model, Kotter’s eight steps of change, Nudge Theory, The ADKAR change management model, Kübler Ross Change Curve, Bridges Transition Model, Satir Change Model. This was based on the three first search results on Google when we entered the search term “change management models”, which all included these eight models (Kirti, 2022; Hicks, 2022; Mulholland, 2023). In order to narrow down the selection of models, we searched in Scopus and Business Source Complete and found that the most referenced models were Lewin’s three-step model, Kotter’s eight-step model, McKinsey 7-S model, Nudge theory, Bridges transition theory and the ADKAR model. When we were reading through literature for the literature review, we found that Lewin’s three-step model was considered both foundational and traditional within change management, which made us certain that it should be included (Worley & Mohrman, 2014). As we wanted to look at more than one model but not all of them due to the time limit of our research, we searched for a

criteria which could guide us in the selection of our models. We decided to look at Kotter's eight-step model, Prosci's ADKAR model, and the McKinsey 7S model as the research showed that they could be mapped onto Lewin's phases (Elrod & Tippett, 2002; Rosenbaum, More & Steane, 2018). Finally, we decided to exclude the McKinsey 7S model as it did not fit the criteria of traditional models being described as having "clear beginnings and endings" (Worley & Mohrman, 2014, p.216). Later we realised that the final selection of Lewin's three-step model, Kotter's eight-step model and the ADKAR model were also frequently cited together in our literature review as major change management models (Galli, 2018; Galli, 2019a, Galli, 2019b; Wan, Saade & Wang, 2019; Santos, Quireoz, Borini, Carvalho & Dutra, 2023). This confirmed that the models we had selected were seen as traditional within the field of change management.

## Research approach

In line with the chosen method for this study, we found our literature sample by conducting database searches using relevant key terms. This is a common and well-suited way of conducting literature reviews. Some studies employing the integrative review method also include relevant text from books or magazines, but we decided to only use the results from the database searches. This was because of a limited time frame, but also to simplify the data analysis and comparison process.

Multiple databases were used for this study to ensure a broad and representative sample of studies. The databases included in the search were Scopus, Business Source Complete, Web of Science Core Collection, and APA PsycInfo. These databases were chosen for their worldwide recognition and credibility. In Appendix C an overview of the search words and the initial results yielded can be found. The same search was carried out on each database. However, the limiting filters varied depending on the options available on each database. We limited our search to only articles available in English, listed as 'limited to' in Appendix C. The only time this filter was not applied was when the option was not available as all results shown through our search words were written in English. Each database which was not specifically aimed at business only data was limited to business or management as an extended search produced irrelevant material from other disciplines such as medicine and nursing. In the case of a database including non-peer-reviewed data, we also limited the search results to peer-reviewed only.



## Exclusion criteria

Through the use of the key terms and inclusion criteria listed in Appendix C, we were faced with a sample of 669 articles on Lewin, 182 articles on Kotter and 113 on ADKAR. This amounts to a total of 964 articles in the initial search. Many of these were however either duplicates, irrelevant to our topic or not specific enough. In order to narrow the search to find a more relevant sample for our study, we read through all of the 964 abstracts and excluded a large amount of articles.

	<b>Lewin</b>	<b>Kotter</b>	<b>ADKAR</b>
<b>Scopus</b>	206	84	44
<b>Business source complete</b>	165	46	39
<b>Web of Science</b>	149	26	15
<b>APA Psycinfo</b>	149	26	15
<b>Total:</b>	<b>669</b>	<b>182</b>	<b>113</b>

*Table 3. Database search results for chosen models of change management*

While conducting this exclusion phase we kept a running record of the reasons for why we excluded certain articles. The main reasons for exclusion considering the Lewin search was that the article either focused on other parts of his research on change (such as action research, force field analysis, group dynamics, Harwood studies), the focus of the article was too far away from change management in relation to our definition for it, it didn't mention his three-step model or it was simply not relevant enough to be included or in some cases not at all. The main reasons for exclusion considering the Kotter search was that the article didn't discuss Kotter's model or that it was not relevant enough. Lastly, the exclusion criteria for the ADKAR search was less restrictive since the search itself generated significantly less articles, but it mostly excluded articles that did not have a significant enough focus on the ADKAR model or they were also not relevant enough.

All of the articles that were not excluded were listed on an Excel spreadsheet with the title, author and date as well as with a link to the abstract of the article. At this stage in the data collection process there were 130 articles on Lewin, 75 articles on Kotter and 22 articles on ADKAR. Worth noting is the significant decrease in the articles under the category for Lewin. We attribute this large number of excluded articles to the fact that Kurt Lewin was a founding figure in more disciplines than change management and that a lot of his research on change was not strictly relevant for the scope of this thesis.

Up until this stage we had divided the work between both of us to make the data collection process more efficient. Now we needed to be more thorough and detailed in our exclusion of articles. We therefore sat down together and went through the abstracts of the remaining articles again and either included or excluded each. The important part here was that we had to agree on whether an article was relevant or not. Since we had been reading over 500 abstracts each we had become more knowledgeable on the field and could use that knowledge to determine whether an article should remain or not. This third stage watered down to a sample of 65 articles on Lewin, 39 articles on Kotter and 17 articles on ADKAR.

We printed all of the final articles out and divided them evenly between us. Some articles were not available due to the limits of our access, which decreased the amount again by a handful of articles. Before the thorough reading process began, we agreed on a set number of aspects or categories of these articles that we would highlight using coloured stickers. The use of the colour-coded stickers helped us to be able to compare and integrate the findings from different articles with one another when it was time to start synthesising the material. After we had read all the articles included in the third stage, we reached a final sample of relevant articles that were used to conduct the data analysis. An overview of the findings of the literature review will be presented in the next section.

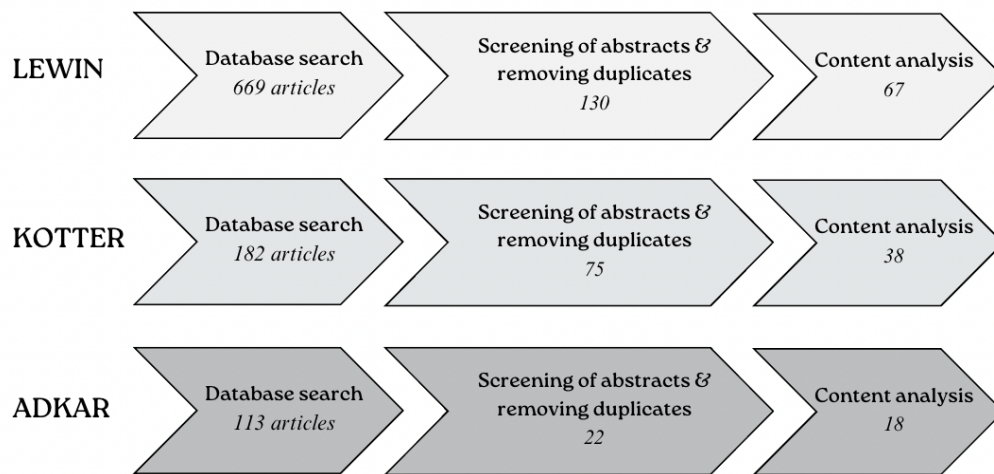


Figure 4. Sequence of chosen change management models search results exclusion process

### Critical discussion of method

The first step of conducting our integrative literature review was to choose which models we wanted to include in our sample. This was more difficult than we thought it would be and we quickly noticed that there was no agreement on what was considered a traditional change management model. We therefore had to include the models that we felt best fit this criteria. In order to ensure transparency we have documented this process in detail. It is possible that we would have gotten different results had we chosen to look at different traditional change management models, such as the McKinsey 7S change management model. However, we feel that since the three models selected are quite similar in style and structure we feel that we are able to draw valuable conclusions on traditional change management models that are step-wise and have a clear beginning and end.

A second aspect valuable to raise in our study is our subjectivity, which meant that there is a risk that we missed relevant articles by the way that we excluded articles through reading abstracts. It is possible that some articles were actually relevant but did not have a sufficiently comprehensive abstract and therefore caused us to exclude it. We did however notice a certain level of saturation based on the papers that we read and many concepts and assumptions documented in our findings were found in multiple papers. This suggests that our sample was still sufficient enough to be able to conduct relevant analysis.

## 4.2. Definition of key terms

Before presenting the findings of the literature review, it is worth discussing some of the key terminology on the field so to not only aid the reader on confusing concepts but also to clarify what we mean when we're using these terms.

*Change agent* - an individual who sees the need for change and is able to present it, which leads to an environment more appropriate for initiating and evaluating change (Nazim et al., 2014, cited in Al-Alawi et al., 2019). Being a change agent also implies some form of leadership and active participation with the change (Luscher and Lewis, 2008, cited in Al-Alawi et al., 2019).

*Change team* - "a group of employees directly involved in designing the change process and applying it. These change teams act as role models" (Ikhrum, 2019, p. 425).

*Change and Change Management* - The word 'manage' derives from the Latin word 'manus', which means hand. This later evolved through Italian to 'maneggiare', meaning to control, and finally to the English verb 'manage'. Therefore, the word itself implies a certain level of control. Change and change management is a highly debated and contested field of study, in many ways based on this assumption that change can be controlled, or as some argue, it cannot. Falconer (2002) challenges this idea of management and control; he argues that change is not controlled and that using the word management implies so, which is ineffective and problematic. Alternatively, Burk (2020, p.3) states that "change management is a defined process", one which has set stages which aid the progression of a transformation, indicating a controlled plan through which a change is managed. However, other researchers, scholars, and implementors have increasingly recognised that change may be understood as a more complex process (Higgs & Rowland, 2005 ; Black, 2000). Chinoperekweyi (2020) identified three shifts in the reshaping of corporate change, which he believes highlight the move away from this traditional view of change management as a singular controlled plan. These are "1) from point-in-time to all-the-time, 2) from analog to digital, and 3) from fixed to flexible." (p.18). This idea of change being a constant state and process and not a chosen state at one particular time has been outlined by many scholars (Tsoukas, 2002 cited in Lawrence, 2015;). Morgan (1986 cited in

Chinoperekweyi, 2020) argues that change aligns with cultural philosophy as it is a normal response to changing human environments.

*Traditional Change Management Model* - Traditional change management models were developed during a time where the environment tended to change slowly and incrementally, and there were relatively short bursts of speedy advancement. This pattern of change in the world can be described as a “punctuated equilibrium” (Worley & Mohrman, 2014). The punctuated equilibrium model posits that organisations are stable entities that only experience incremental change, meaning that there will be states of relative calm and discontinuous, relatively infrequent change. Traditional change management models were developed as a tool for managers to implement change initiatives during these states of relative stability and calmness (Worley & Mohrman, 2014). However, in recent decades the business environment has changed drastically and there are no longer extended periods of relative calm (Worley & Mohrman, 2014). The modern world is characterised by complexity, which changes the conditions for effective change management significantly. Traditional change management models are also characterised by “clear beginnings and endings” (Worley & Mohrman, 2014, p. 216).

### 4.3. Lewin’s Three-Step Model of Change

#### Introducing the Model

Kurt Lewin (1951) argued that successful change requires a three-step process based on the concepts of unfreezing, changing and refreezing (Weick & Quinn, 1999). This has become known as Lewin’s three-step model of change, and it can arguably be considered the most influential change management model and is the most widely used and applied model (Cummings, Bridgman & Brown, 2016; Galli, 2019b; Adam, 2022). It has made an impact in the area of change management and has inspired many of the newer change models, with this as the basic frame (Adam, 2022; Jarvis & Ortega, 2010). Lewin’s model is primarily focused on planned change through the human side of the organisation, placing importance on groups and teams (Burnes, 2004a). Lewin focused on a bottom-up model, meaning it focuses more on an individual level and targets the employees and other key stakeholders (Galli, 2019a). The last step of his model was originally called “freeze”, but for the purpose of this study we have decided to use the term “refreeze” as this is how it has been more widely used (Cummings,

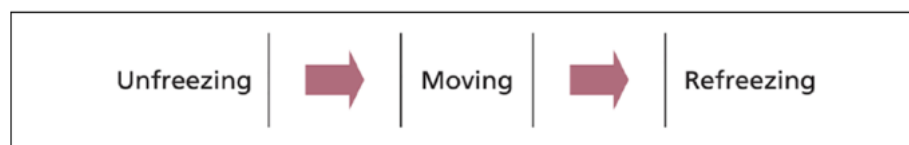
Bridgman & Brown, 2016). The three steps are designed in such a way that they work to reduce the possibility or level of resistance to change; this differs from other models, which work to encourage a desire for change from employees (Galli, 2019a). This design is based on the idea behind the model that in any situation for change there are forces working for and against the change, which maintains an equilibrium. In order to successfully implement change, Lewin argued that you need to increase the forces pushing for a change, while decreasing the forces that work towards maintaining the status quo (Burnes, 2020). This is why such focus has been placed on his first step, as it is aimed at decreasing the forces of stability.

The first step of his model is to *unfreeze*, which is aimed at creating an awareness of the need for change and a sense of urgency (Ford & Greer, 2006). This stage is also used to identify resistance to change forces and allow for solutions to be created to aid in reducing such resistance (Galli, 2019b), a component which Lewin judged to be of utmost importance for successful change (Levasseur, 2015). The second step is the actual *change*, which is about moving from what used to be and adopting strategies to end up in the desired state (Ford & Greer, 2006). The last step is for an individual, group or organisation to *refreeze*, meaning that they consolidate the change and the new behaviours (Ford & Greer, 2006). This stage is vital to the success of a change process as these new norms resulting from the change can easily vanish soon after they are implemented if not (Galli, 2019b). An example of this would be giving feedback that highlights the effectiveness of the change as well as providing incentives that reward the new behaviour. Jarvis and Ortega (2010) highlight that these stages should not be viewed as distinct from one another and that they are integrated with the differentiation between them becoming blurred.

The final sample of articles on the topic of Lewin's three-step model of change that were used for the literature review included various types of research. There were biographical accounts of Lewin, literature reviews, case studies and critical evaluations of the usefulness of his model. One of the apparent experts on the contributions of Kurt Lewin is Bernard Burnes, whose name appeared as an author in a total of six articles in the final sample (2004a; 2004b; 2004c; 2020; Burnes & Cooke, 2012; Burnes & Bargal, 2017). Burnes is a strong advocate for the significance

of Lewin's three-step model of change and along with most authors on the topic he views Lewin's ideas as the foundation of change management (Schein, 1996).

As mentioned, Burnes has written extensively on the topic of change with concern to Lewin. In his most recent article, Burnes defends Lewin's work against criticisms of his three-step model as being too "simplistic" and the suggestion that Lewin never developed such a model (Burnes, 2020). He argues Lewin never depicted his model in the way it is conventionally depicted (see Figure 5). This depiction shows the phases of unfreezing, change and refreezing as moving in a sequential, step-by-step manner.



*Figure 5. The conventional way of looking at Lewin's three-step model of change (Burnes, 2020, p.48)*

Instead, Burnes (2020) argues that Lewin's three-step model of change is inherently built on and intertwined with his other research, particularly on field theory, an argument that is also supported by Rosenbaum, More & Steane (2018). This theory builds on the idea that there are constant forces which influence behaviour. For example, if an individual wishes to start speaking up more in public, there will be forces of the fear of embarrassing oneself that push back against the force of change. Lewin saw the field theory as related to the three steps of change (Lewin, 1947), and according to Burnes described the process of change as an "iterative process of fact-finding, action and further fact-finding" (Burnes, 2020, p.48). Burnes (2020) version of Lewin's model is depicted in Figure 6 and it is visually much less linear than the conventional depiction (see Figure 5). Lewin described these three aspects of successful change individually and although it can be interpreted as their order is implied, he does not clearly state that individuals, groups or organisations have to move from one step to the next in the same order or that these are the demands of the model (Lewin, 1947).

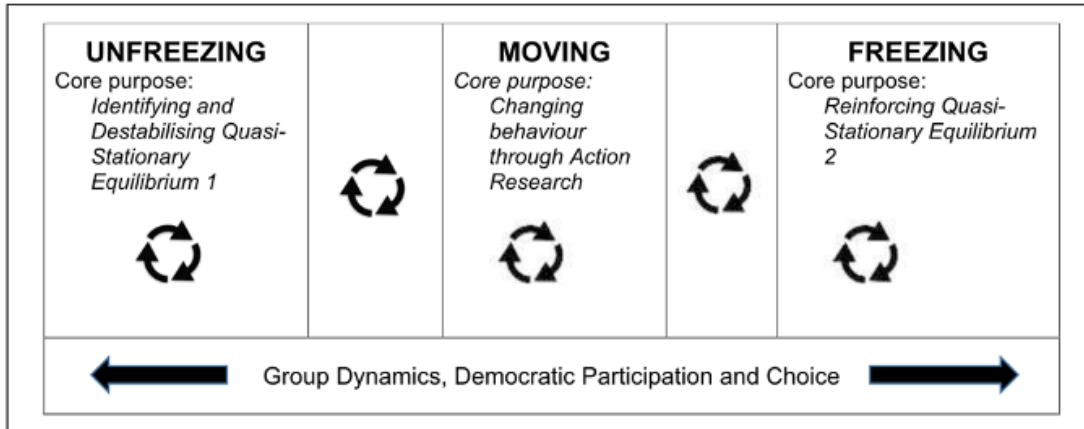


Figure 6. Lewin's three-step model of change with field theory visualised (Burnes, 2020, p.49)

Other researchers have argued that Lewin never developed such a model at all and that the conventional depiction of the model was created post-Lewin (Cummings, Bridgman & Brown, 2016). They argue, in line with Burnes (2020), that Lewin viewed change as a continuous and fluid process. Although in agreement on this point, Burnes (2020) places strong criticism on the notion that the three-step model was not created by Lewin, which he argues that if it were true would mean that we would need to rewrite the past 60 years of change management history.

### Contextual Assumptions of the Model

There are a number of basic assumptions on which Lewin's three-step model is based. Some of these are based upon Lewin's personal assumptions, others are situational, and others are contextual. The foundation of the three-step model is based upon Lewin's opinion that the most successful way to implement a change process was to combat resistance to change (Burnes, 2020).

The model's design assumes control over the context in which change occurs, in particular, that it is planned change (Galli, 2019b). The model also assumes a steady state in which the organisational change can occur (Mangaliso, Mangaliso, Ndanga & Jean-Dorris, 2021). As previously discussed, complex environments do not always facilitate change in such a planned manner and often call upon reactive or continuous change measures. This is also evident as Lewin's model requires information to be gathered and understood in order to combat potential



resistance to change in the unfreezing stage (Adam, 2022). This implies that all information should be available to gather before beginning the process, something which we have come to understand is not always true, particularly in the context of complexity.

One of the key assumptions of the three-step model is that change is progressive, meaning it involves moving from point A to an improved or more favourable situation at point B along a designated step-by-step path, meaning it is also assumed change is a linear process (Marshak, 1993). This also highlights the further assumption that the change process should be goal or destination-oriented, striving to reach one specific endpoint (Marshak, 1993). This ignores the potential process and goal of a change in a complex world which requires constant, evolving change to survive and not one singular, exact change. It further implies that according to the third step, a process can be 'refrozen' and that a situation may be stable enough to ensure refreezing of implemented changes (Jarvis & Ortega, 2010).

## Strengths & Weaknesses

Lewin's three-step model has met both high levels of praise and criticism. One of the greatest criticisms of Lewin's approach is that it is overly simplified, with Burnes (2004b, cited in Muldoon, 2020) arguing that Lewin's research is "too simplistic to have real value for scholars and practitioners" (p.627). It is argued that the model is overly simplistic and mechanical in its implementation in the face of continuous change (Galli, 2019b; Dawson, 1994, cited in Bose, 2020). Jarvis and Ortega (2010) also argue that the model has its limitations as it does not acknowledge the existence of change which is continuous and cannot be restrained by distinct step-wise approaches. Galli (2019a) further argues that the model is too general and does not provide enough details for implementation. However, on the contrary, Johnson, Nguyen, Groth, Wang and Ng (2016) argue that this broader and more simplistic view is what makes Lewin's model applicable across a broad range of settings and for different types of initiatives. This is further backed by Crosby's (2022, p.42) statement that "simplification, in the right dose, is very helpful," which he argues that all models are a simplification. He acknowledges this simplification does not mean that the process itself is simple, an argument Boak (2021) also supports, claiming that Lewin was aware that change processes and efforts were complicated and

not easily simplified. Instead the model is designed to be a simplified framework to guide the process of planned change.

Lewin's three-step model to change is also divisive in relation to its approach to resistance to change. Galli (2019b) argues that the model focuses on overcoming resistance to change and ignores other perspectives or elements of a change process. However, he also argues that when resistance to change is already high during a change process that Lewin's model is a good choice to guide the implementation of the change (Galli, 2019b).

The model is divisive in terms of its appropriate implementation. The model has been interpreted and implemented in a linear, sequential fashion. As previously outlined, linearity is not always a definite, especially in the face of complexity. Bartunek and Woodman (2015) argue that this assumption of linearity and static qualities may not be cohesive with the context of a change process. Researchers argue that Lewin's model is not equipped for continuous or evolving change (Galli, 2019b). Weick and Quinn (1999, cited in Bartunek & Woodman, 2015) argue that in order for Lewin's model to work in a continuous change environment it would have to follow a different "structure of freeze-rebalance-unfreeze" (p.161). However, Weick and Quinn (1999) also recognise the benefit of using Lewin's model for episodic change, and argument which is also supported by other researchers such as Galli (2019b) who argues Lewin's model is only applicable and integratable in isolated, progressive change processes. The linearity of Lewin's model is highly contested in this respect. It is questioned whether through this continuous change, especially in a complex situation, whether stages that follow a sequential route may not be applicable (Purser & Petranker, 2005 cited in Bartunek & Woodman, 2015).

Lewin's model has been met with criticism for its lack of instruction for implementation. Davis and Taylor III (1976) highlight that Lewin's model does not adequately address how to use the model to implement a change in the organisational structure. The model has been questioned for its limited prescriptive nature in relation to outlining the affective change processes, which is attributed to its broad and unspecific nature (Johnson et al., 2016). However, Johnson et al. (2016) also argue that this broad, unspecific nature also enables the model to be used for a wider range of change processes and initiatives in differing situations.

## 4.4. Kotter's Eight-Step Model of Change

### Introducing the Model

In his book “Leading Change” (1996), John P. Kotter introduces an Eight-Step Model of Change. The model was developed based on his own experience and observation of 100 organisations going through some form of change while he was working as a consultant. The book was sequential to his 2005 study on the eight essential mistakes which he witnessed throughout change processes. The model was based on Kotter's personal observation and was not a theoretically backed or academic study (Hughes, 2016). He did this in a bid to create a model specifically aimed at change practitioners and implementors and not for the focus of scholars (Clay, 2017). In his model, Kotter argues that any organisation going through a change must pass through all of the eight steps in sequence (Kotter, 1996). He stated that “skipping steps creates only the illusion of speed and never produces a satisfying result... critical mistakes in any of the phases can have a devastating impact, slowing momentum and negating hard-won gains” (Kotter, 1995). The model has been described as structured, linear, and sequential (Pollack & Pollack, 2014).

The eight-step model sequence is as follows; 1) establishing a sense of urgency, 2) forming a powerful guiding coalition, 3) creating a vision, 4) communicating the vision, 5) empowering others to act on the vision, 6) planning for and creating short term wins, 7) consolidating improvements and producing still more change, 8) institutionalising new approaches (Kotter, 2007). Kotter outlines the eight-stage process and the elements of each stage in the table below.

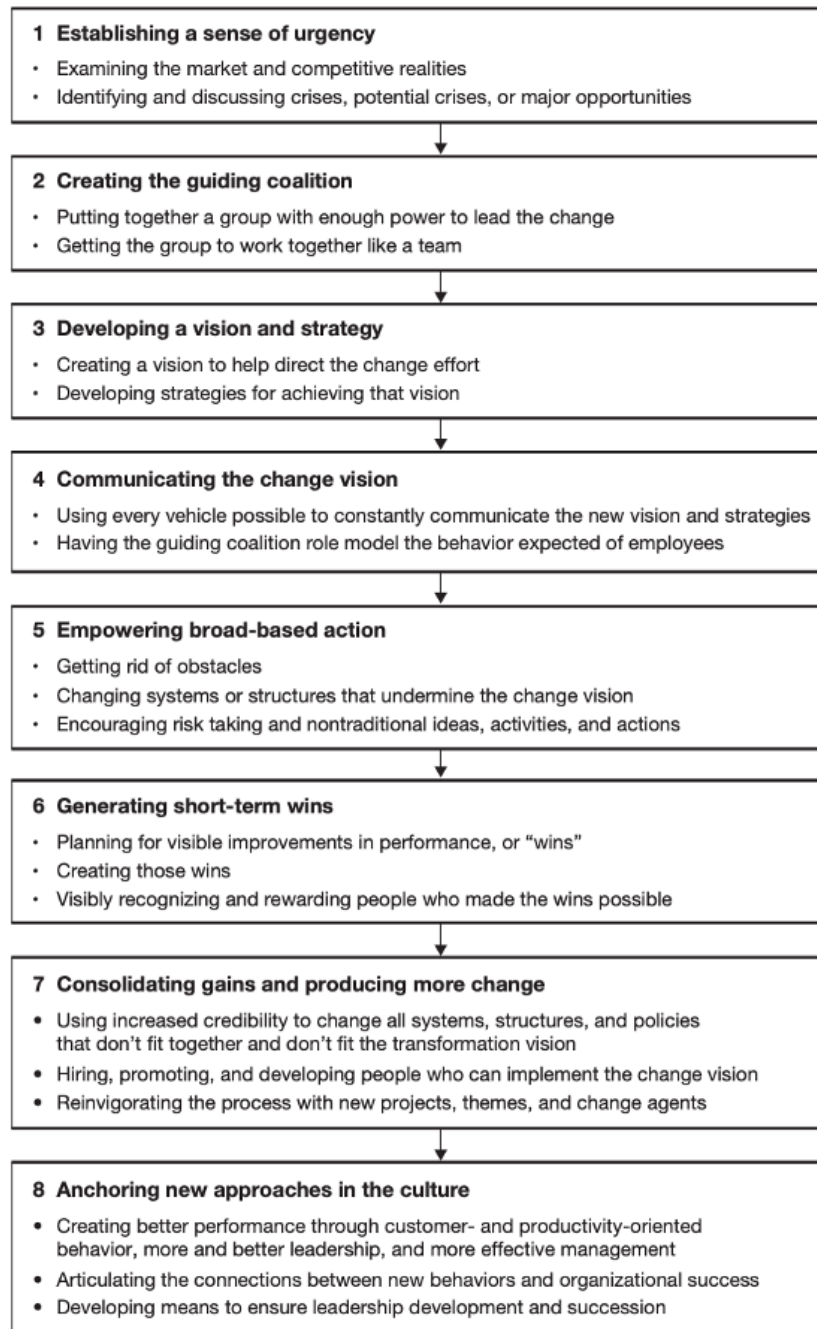


Figure 7. The eight steps of Kotter's change management model (Kotter, 1996, p.23)

Kotter's eight-step model has been compared to Lewin's three-step model, as Lewin's concept of unfreeze, change and refreeze is noted as a recurrent theme in more contemporary change models (Hughes, 2016). Sidorko (2008) groups the eight steps of Kotter's model into three categories; preparation, action, and grounding. Preparation refers to steps 1-4, action refers to

steps 5-7, and grounding refers to step 8. Similarly, Hughes (2016, p.455) describes Kotter's steps 1-4 as helping to "defrost a hardened status quo," likening it to Lewin's first step, unfreeze. He continues to outline that steps 5-7, which introduce new processes and practices, can be equated to the second step, change, from Lewin's model. Finally, he likens Kotter's step 8, to anchor new approaches, to Lewin's stage of refreeze. Kotter (1996) also refers to the steps of his model in the same groupings, notably referencing steps 1-4 of his own model as the "warm-up" (p.25) or "defrost" (p.24) stage.

### Contextual Assumptions of the Model

Kotter's eight-step model was designed with a number of assumptions underpinning it. One of the most recurring assumptions discussed in the existing literature is Kotter's assumption that change will be met by resistance (Nitta et al., 2009; Hughes, 2016). Kotter (2008, cited in Pollack and Pollack, 2014) argued that it was complacency and not a desire for change which would most likely be identified in established organisations as the norm. This lack of desire which Kotter has identified, would also play into his assumption that people are most likely to resist change if it is not something which they wish for or are looking for.

Kotter's model was designed as a sequential model, stating that "successful change of any magnitude goes through all eight steps, usually in sequence" (1996, p.23), while earlier stating that "skipping steps creates only the illusion of speed and never produces a satisfying result" (1995). This approach portrays an underlying assumption that change implementation is linear, meaning that Kotter would assume that each step is easily followed by the next without the need to regress or progress past a step (Sidorko, 2008). As we have identified through our research on complexity, linearity is not always feasible in a complex environment. Kotter's model on change was not designed with this in mind, but rather assumes the relevance and usability of a linear, sequential process. Sidorko (2008) argued that Kotter's model implies that by finishing the sequential steps of the model, one would achieve a desired outcome of a successful change process. This is only facilitated by the assumption that the model can be followed in its linear form. In contrast to Kotter's belief that his model should be followed sequentially, Carter (2014, cited in Hackman, 2017) found that the stages of the model frequently happened simultaneously. This led to a discussion of the stages in the context of three phases; "planning, implementation,

and current status and future plans” (p.2). Further to this, Jiang (2022) argued that change was not a linear process and that “many steps are highly overlapping and interrelated (p.805) when reviewing the model in the case of a university transformation.

Kotter assumes that change is top-led (Pollack & Pollack, 2014). The eight-step model puts a strong emphasis on leadership (Pollack & Pollack, 2014). Nitta, Wrobel, Howard and Jimmerson-Eddings (2009) outlines that this assumption that change must be led was validated by empirical evidence from a change implementation case study at Little Rock School District. However, Kotter doesn't just assume that a change process requires strong leadership; he also states that “transformation is not a process involving leadership alone; good management is also essential” (1996, p. 129).

Kotter assumes that with his model comes a certain level of communication. It is desirable that this communication would be strong and positive, an assumption that Kotter has made to be true for the development of his model. Connolly, Wolfgram and Santos (2012) highlight that throughout Kotter's model communication is a key recurring theme. They highlight this as important as implementing a successful change process alone would be near impossible. They further elaborate that it is crucial to involve stakeholders for multiple perspectives and also to engage them in the change to reduce resistance. Kotter (2007, cited in Busse & Doganer, 2018) also highlighted that by decreasing the influence others can have on the change it can impede on levels of trust and understanding from the individual. However, this communicative involvement and inclusion may be argued to assume that communication between parties will be positive, invited and productive, especially if Kotter's assumption that change is always met with resistance is true.

As will be further outlined below, Kotter's model has been met with much praise and also criticism, one of which is academic integrity. It must be noted that Kotter's model was based entirely off professional observation and not academic study (Hughes, 2016). Therefore, it may be argued that Kotter is also assuming that his interpretation of change process observations has been accurate enough to design such a model, even without any empirical study or academic

research to support it.

## Strengths and Weaknesses

As outlined above, Kotter's model was based upon his own observations of change from 100 organisations while he was working as a consultant. The model was developed entirely on Kotter's own interpretation and observation of what he witnessed. This lack of integration with or inclusion of academic support has been one of the most prominent criticisms of his model. Appelbaum, Habashy, Malo and Shafiq (2012) noted that Kotter did not make use of any formal studies in the development of his model which would prove its structure. Nitta et al. (2009) further highlighted that Kotter was criticised for his lack of academic referencing and for placing a heavy reliance on scientifically unfounded evidence and data. Hughes (2016) is argumentatively one of the most critical scholars of Kotter's model. He shares his disdain with the academic reliance on Kotter's model when its development is not tested or based on any empirical or theoretical study. Alternatively, Naude, Dickie & Butler (2012, p.20) argue that Kotter is "a credible academic," as he works as a Harvard professor and has previously published numerous academically founded books and papers. This does not provide a tangible excuse for lack of academic support in this context but creates a foundation of respect for his knowledge and judgement within the wider change management field. Appelbaum et al. (2012) carried out a review of Kotter's model in which they analysed the relevance of each step in accordance with existing academic research on the area. This study, while outlining some minor criticisms, ultimately displays great support for Kotter's model. The study looked for empirical and academically based arguments which supported or contested Kotter's claims and for each of the eight steps found that there was support evident, and ultimately found that the eight steps of the model were still significant at the time of the study as when the model was created. In an educational setting Ravi, Patel, Laurence, Sebok and Gharahbaghian (2022) claims that Kotter's model is still the most frequently taught model for effective change in business schools, and Lester (2007 cited in Nitta et al., 2009) stated that it was still the best book on change management published at that date.

As was also evident with Lewin's model of change, one of the biggest criticisms of Kotter's model is its linear form. Sidorko (2008) stated that Kotter's linear approach ultimately lacked

flexibility which would aid with problems that could arise during change, and which may be of extra relevance in a complex environment. Hackman (2017) found that the linear fashion and sequential approach that Kotter outlined was not always as applicable as he had intended, stating that stage seven and eight were not as distinct as Kotter instructed. Instead he highlighted that these two stages took on a cyclical nature in the event of department growth and evolution. A similar occurrence was noted by Nitta et al. (2009) in the case of a leadership change in a school district where they found that step four and five also did not work best in a sequential structure, instead arguing that these two steps would work better happening simultaneously or perhaps even in the reverse order. Alternatively Wheeler and Holmes (2017 cited in Davis, 2022) found that the sequential step-wise nature of Kotter's model worked in the favour of a change process on a library campus. This created many positive outcomes while following the model as prescribed, highlighting the success of the model when followed in a sequential manner. When looking at these examples of change processes which implemented Kotter's model and with differing results it can be understood that Sidorko (2008 cited in Farkas, 2013) questions how practical a sequential model can be when situations can be so diverse.

Although Kotter has outlined eight steps to guide the implementation of successful change this has been met with criticism that it is not instructive or detailed enough on the implementation of change and also praised for a breadth of interpretation which can be achieved. Another argument interprets the model to be overly detailed. Appelbaum et al. (2012) highlights that the model is not detailed enough to be able to guide change in every situation. Farkas (2013), however, argue that there is no one-size-fits-all solution to change and that instead Kotter provides a helpful guide with steps which can work toward a successful change. This guide or framework has also been criticised by Stragalas (2010) for not providing an action plan for change. Similarly, Pfeifer and colleagues (2005 cited in Pollack & Pollack, 2014) argue that the model describes what has to be done for the change process but not how it can be achieved. However, Ravi et al. (2022) praise the broad nature of the model. Despite some criticisms on the model's lack of detail, others are more concerned with the overly detailed and restrictive nature of the model. Ansari and Bell (2009 cited in Pollack & Pollack, 2014) argued that Kotter's model was sometimes not general enough, and therefore overly specialised or specific, for certain types of change. Hay



(2001, cited in Pollack & Pollack, 2014) also argued that Kotter's plan was overly planned, outlining that this guide for change did not necessarily represent realities on organisations.

## 4.5. ADKAR Model

### Introducing the Model

The ADKAR Model for change was developed by Jeff Hiatt (2006). ADKAR works on the presumption that organisational change can only happen when individuals change; in this way, it focuses on the process of guiding individuals through a change. The model can however also be adapted to groups and organisations (Calder, 2013, cited in Jaaron, Huazi & Musleh, 2022). It is built on a five-step sequence which outlines the necessary phases for an organisation to work through to implement successful change (Bose, 2020) and it focuses on the individual and is goal-oriented (Cronshaw, Boddy & Reilly, Boardman, Portas, Hagan, Griffiths, Donovan, Clark, Collins, Linley, Salt, Wright, Sheahan-Perry, Cooper, Jones, Sunderland, Charles Manning, & Chrispen Marufu, 2021). ADKAR is an acronym for Awareness, Desire, Knowledge, Ability, and Reinforcement. These five steps are *awareness* of the need to change; *desire* to support and participate in the change; *knowledge* of how to change; *ability* to implement the change on a day-to-day basis; and *reinforcement* to keep the change in place (Al-Alawi, Abdulmohsen, Al-Malki & Mehrotra, 2019).

Prosci (2023) states that most change processes fail because employees don't understand how to make the change or why it is important. The ADKAR acronym is used to equip managers or leaders with the right knowledge and tools to navigate these challenges. Prosci argues that this focus on enabling and driving individual change allows for organisational-wide results to follow (Prosci, 2023).

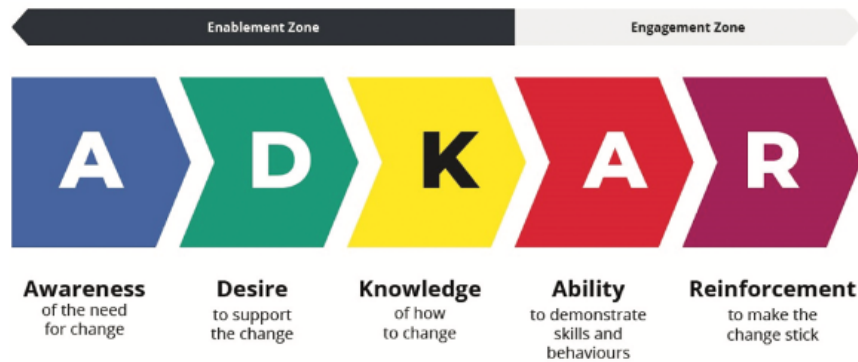


Figure 8. The five steps of the ADKAR model (Mellor, McCabe, Byers, von Treuer, Karantzas & Goodenough, 2022, p.1229)

Interestingly, the ADKAR Model is linked to Lewin's Three-Step Model of Change, with scholars arguing that the two models are very similar (Bose, 2020). The first two phases of ADKAR, awareness and desire, are comparable to Lewin's first stage, unfreezing (Bose, 2020). Awareness is used to make employees understand why a change is needed, the risks associated with not implementing change, and outlining how the change will occur (Bose, 2020). Desire is then created by making employees want to be a part of this change as they see its benefits and want to engage with it (Bose, 2020). Similarly, Lewin's stage one, *unfreeze*, entails lowering the barriers to change and motivating employees to be part of the change (Galli, 2019a). The third and fourth phases of ADKAR, knowledge and ability, are equated to the changing stage of Lewin's model (Bose, 2020). Knowledge refers to equipping employees with relevant information, skills, and techniques through education and training to aid in implementing the change (Bose, 2020). Ability is used to describe the point at which employees are adept to deliver the performance needed to implement the change (Bose, 2020). Lewin's second stage, *change*, also refers to the point at which change processes occur, employees are trained with the appropriate tools for the change and knowledge is expanded (Galli, 2019a). Finally, the fifth phase of ADKAR, reinforcement, relates to the final stage of Lewin's Three-Step Model, refreezing. Reinforcement relates to the actions and factors which contribute to sustaining the implemented change (Bose, 2020). *Refreeze*, Lewin's final step, also focuses on reinforcement as it is at this point that changes which were implemented are 'refrozen' into organisational norms (Galli, 2019a).

## Contextual Assumptions

Similar to Lewin's three-step model and Kotter's eight-step model, the ADKAR model makes the key assumption that change is progressive and an effort to facilitate the human side of change should be applied in a sequential manner in order for it to be successful (Jaaron, Huazi & Musleh, 2022). In other words, a change agent would need to implement the model in the order that it was originally intended for and that each step builds upon the previous step, meaning that it is not recommended to skip any of the steps (Kliewe, Davey & Baaken, 2013; Jaaron, Huazi & Musleh, 2022)). Lowery (2010, cited in Jaaron, Hijazi, & Musleh, 2022) suggested that if one step of the model is not completed successfully, then it will inhibit the next step. Mellor et al. (2022) also suggest that "all five steps need to be completed in sequence for change to occur, although it is possible to move back and forth between steps throughout the change process" (p.1229). This implies a strong sense of linearity inherent in the model and that even though it is intended to be implemented in a single direction, it is also possible to move backwards in the opposite direction if more initial stages need to be reinforced.

An exception to the assumption that all steps need to be implemented successfully in order to move forward is displayed by one recent study on the adoption of BIM (Building Information Modeling) in construction projects. Their study used the ADKAR model to successfully manage their change initiative (Jaaron, Huazi & Musleh, 2022). The researchers were able to adapt the ADKAR model differently for the involved stakeholders in the construction project, arguing that this was possible because of the different role each party plays. In this case, the client in the project only needed an *awareness* and *desire* for the change, and the government only needed *awareness*, *desire* and *reinforcement* to be able to successfully participate in the project. The authors argue that because these stakeholders were not actively implementing the BIM technology, they did not need the knowledge or the skills that were still relevant for the engineers and construction workers taking part in the project. Government was still seen as vital for the reinforcement-step of the new technology, since the government would have the power to encourage individuals through formal license, engineering councils and contractors' unions. (Jaaron, Huazi & Musleh, 2022)

Another assumption of the model and the original creator Jeff Hiatt is that the most important step is the first one. In an initial study on 411 companies all going through significant change, it was shown that the most important factor for resistance to change and in turn change project failure was the complete lack of awareness of the need for the change being implemented (Hiatt, 2006, cited in Jaaron, Huazi & Musleh, 2022). “The power of the ADKAR model lies on its ability to focus on the first dimension out of the five dimensions that is the root cause of failure of change” (Jaaron, Huazi & Musleh, 2022, p.656). Although Hiatt (2006) argues this step is vital, it has also been shown that the ADKAR model is only able to accurately demonstrate change when all elements are sufficiently evident (Kazmi & Naaranaanoja, 2013). This relates to the idea that one or several steps in the model can act as ‘barrier points’, which inhibit individuals or organisations from reaching the end state. If *awareness* or *desire* are the barrier points, then “one will see little or no evidence that the change is taking place” (Kazmi & Naaranaanoja, 2013, p.223). If it is at the *knowledge* level, then individuals will show a state of confusion, not knowing what to do, whereas if the barrier point is at *ability* then individuals will “seek constant help from their manager or co-workers and resist independent responsibility taking in official tasks” (Kazmi & Naaranaanoja, 2013, p.223-224). Lastly, if the individual lacks *reinforcement* of the change, then their enthusiasm and energy levels will tend to decline or even revert back completely to the previous ways of doing things before the change was implemented (Kazmi & Naaranaanoja, 2013).

## Strengths and Weaknesses

Just like any model applied in the context of change management, Hiatt’s ADKAR model (2006) has some particular strengths and weaknesses which can help change agents to determine whether the model is appropriate or not for their organisational context. For example, within the nursing task force the model has been appreciated for its simplicity (Pawl & Anderson, 2016). In contrast to this, Galli (2019b) criticises this simplicity as it does not provide enough explanation on the implementation of the change for each step.

Several studies also highlight the focus on the individual progress of change (Jaaron, Huazi & Musleh, 2022; Al-Alawi et al., 2019), an important part that the other two change management models have been criticised for missing (Jaaron, Huazi & Musleh, 2022). Galli (2019b) noted

that the model could be applied for a large organisation as this is its main focus. However, Galli (2018b) argues that ADKAR's focus on the individual and people side of change is not as suitable for larger organisations in every context, particularly for project management in navigating a complex change process. This may limit the model's reach and applicability more than other models.

Another strength lies in its ability to divide the change process into concrete parts, which helps change agents be able to identify at what stage they need to focus their time and resources in order to ensure the success of the change project (Al-alawi et al., 2019; Boca, 2013 cited in Jaaron, Huazi & Musleh, 2022). Alternatively, the ADKAR model has been criticised for its focus on linearity and following each step in a sequence, because if one element is weak then the whole change process can fall apart (Kliewe, Davey and Baaken, 2013). This makes it difficult to facilitate change in an environment characterised by complexity since it is likely that some elements are affected in unpredictable ways.

## 5. ANALYSIS

The scope of this study has been limited by the framework of complexity, meaning that we have presented the findings from the literature review in a way that has focused solely on the aspects of the background of the model, the assumptions as well as the strengths and weaknesses that are relevant to evaluate in relation to complexity. In this chapter we will examine the relevance of the traditional change management models selected for this study (discussed in Chapter 4) using the framework we have created (presented in Chapter 3).

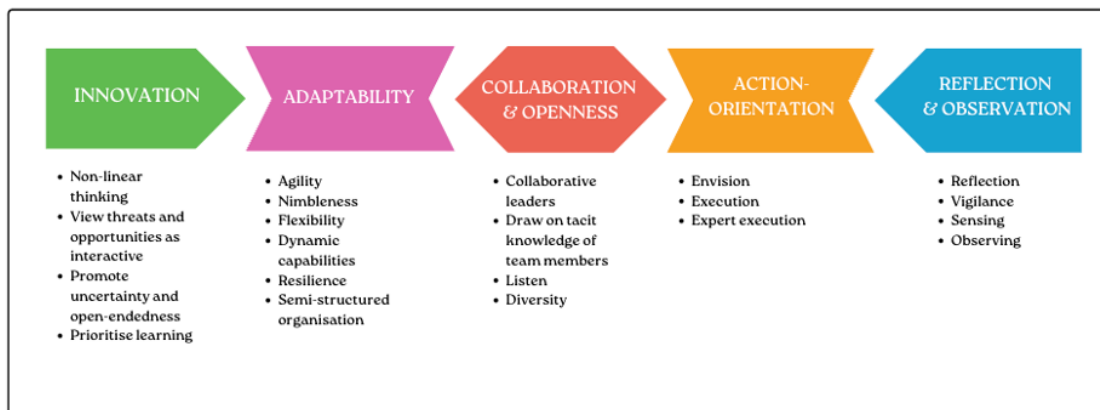


Figure 9. Summary of Five Pieces of Operating Within Complexity Framework

### 5.1. Lewin's Three-Step Model & Complexity

Lewin's unfreeze-change-refreeze model is not only the foundational change management model, but its credibility and popularity has persisted through time (Bakari, Hunjra & Niazi, 2017). Despite significant changes since the model was proposed in 1947, such as globalisation and technological development (Motamedi, 2007), management consultants still view his change model as a powerful tool (Levasseur, 2001; Bartunek & Woodman, 2015). The literature review on his model (see Chapter 4) has highlighted the characteristics of both the original model and the conventional one, showing the difference between how Lewin himself intended it to be used and how it has conventionally been adapted (Burnes, 2020). It has also highlighted the assumptions different authors attribute to the model as well as the strengths and weaknesses that have been noted through empirical study.

Interestingly, the literature review revealed significant similarities between Lewin's three-step model and subsequent models, arguing that most change management models are built on the ideas of Lewin (Rosenbaum, More & Steane, 2018; Hendry, 1996, cited in Muldoon, 2020). If this is the case, then the evaluation of Lewin's three-step model in a complex environment becomes even more important as it could implement other models by extension. There are authors on both sides of the debate on the relevance of Lewin's model, but in this section we aim to critically and objectively examine the relevance of his model using our framework on dealing with change in a complex environment. We will do this by looking at the findings in the previous chapter, which are based both on his original writings on the model as well as subsequent interpretations of it.

## Innovation

### *Non-linear thinking*

Lewin's model is widely recognised and developed as a linear model, taking sequential steps throughout the process to reach an ultimate, predefined end goal. This is a linear, progressive style (Marshack, 1993) which, in its very nature, directly counteracts the idea of non-linear thinking and any implementation or use of this frame of thinking. Jarvis and Ortega (2010) recognised that this distinct set of step-by-step plans to guide change was an enormous limitation of Lewin's model. Ford (2009) also criticised this linear approach as it limited possible alternative dynamics. Lewin's model was not designed to facilitate non-linear thinking.

### *Promote uncertainty and open-endedness*

Lewin's approach to change as planned and linear with a clearly defined goal does not pertain to that of promoting uncertainty and open-endedness. Lewin's approach to change encourages and facilitates a planned approach which aims to meet a specific goal. This strive to meet a designated end-goal does not adhere to the promotion of innovative thinking which encourages open-endedness. A rigid plan which has been carefully orchestrated and defined by the context of the environment in which it was created does not promote uncertainty. Instead it promotes an ideal that this uncertainty may be avoidable if the change process is followed according to the plan, which displays ignorance to the nature of complex environments.

### *View threats and opportunities as interactive*

Lewin's three-step model has one reoccurring pattern which affects innovation, and that is the need to create a plan based on all available knowledge before the change process begins. This has an enormous impact on the facilitation of innovation. In a complex environment it is common for new challenges and opportunities to present themselves as the situation changes. The implementation of a predefined plan does not lend itself to change the course or design of the change process, therefore it could be argued that it also ignores the possibility of interpreting newly presented threats and opportunities as interactive.

### *Prioritising learning*

Bartunek & Woodman (2015) argue that Lewin's model lacks a cognitive dimension, based on the argument that it was developed before there was a cognitive revolution. They argue that subsequent researchers have added these characteristics to the model (Schein, 1996; Weick & Quinn, 1999). For example, Schein (1996) argued that change encompasses the restructuring of individuals' frame of mind. On the other hand, other authors have argued that Lewin placed a central focus on learning and restructuring of individuals' perceptions (Burnes, 2004a). Lewin's model is widely recognised as focussing on reducing or attempting to eliminate feelings of resistance to change from employees (Galli, 2019b). Galli (2018) highlighted that the change process, as designed by Lewin, must-have resources prepared to facilitate training, education, and learning in line with the change process as this feeds into reducing the risk of resistance to change.

## **Adaptability**

### *Agility*

Agility refers to the organisation's ability to change quickly in a complex environment, highlighting the importance of not getting stuck in just one particular way of doing things. The Lewin three-step model's final stage is refreeze. This stage relies on embedding the conditions which are altered in the change process as a new normal or standard practice (Galli, 2019b). This affirming of a standardised and set way of carrying out organisational work opposes the idea of being agile.



### *Flexibility*

Although Lewin's three step model has a prescribed path to follow, Jarvis and Ortega (2010) argue that the final stage, refreeze, may be viewed as "flexible and continuous" (p.285). This may be argued for as the solidifying of changes implemented during the process may need to be adapted for the situation at the time. This may differ to the 'change' stage, and the working or culture of the organisation may continue adapting long beyond the point of the change process.

### *Dynamic capabilities*

Lewin's three-step model has been criticised for its linear design as it displays a lack of dynamic processes when change itself is dynamic (Ford, 2009). The formulation of Lewin's model does not make way for or promote dynamic approaches to dealing with change, something which is particularly evident in the face of complexity where unstable environments or situations are present. Complex environments also give way to sudden changes, something which can be catered for where dynamic capabilities are present, yet are missing from Lewin's three step-model.

### *Semi-structured organisation*

To be adaptable as we have defined it implies some levels of agility, nimbleness and flexibility (see Chapter 3). However, in Lewin's three-step model he assumes that change should happen to a stable system, which after the change has been completed should turn into a new, but stable state (Lewin, 1947; Burnes, 2004c). This is because much too often the implemented change initiative is short lived if even successful at all. Therefore he argues that making the change is not sufficient, but that there needs to be some form of sustaining the change. Lewin states that "permanency of the new level, or permanency for a desired period, should be included in the objective" (Lewin, 1947, p.35, cited in Burnes, 2020). However, this assumption of stability before and after planned change does not seem to fit the criteria for a complex environment, particularly regarding the importance of remaining adaptable. These ideas are in fact contradictory as having a stable system implies that it is not easily shifted by external or internal forces. This idea is supported by Burnes and Cooke (2012) who argue that "if organisations are too stable, nothing changes and the system dies; if too chaotic, the system will be overwhelmed

by change” (p.1407). Therefore a semi-structured organisation seems ideal, but Lewin’s view of change as planned seems to be based on the assumption that organisations should operate most of the time out of a position of stability.

*Nimbleness and Resilience were not addressed in the model.*

## Collaboration & Openness

If there is one thing that Lewin focused on with his intentions with creating the unfreeze-move-freeze model, it is the notion that people and social processes are an essential part to instigating behaviour change (Lewin, 1947). As Richardsson, Corbitt & Ling (2009) argued, “Lewin (1948) recognised the importance of open discussion between stakeholders, representing different management levels within an organisation, to learning” (p.102). With the focus on the “unfreeze”-stage, which is all about shifting attitudes towards change by allowing affected individuals to be included in the change process, Lewin places a significant focus on the collaboration and openness-aspect of our framework. One aspect that Lewin could have highlighted however is that of diversity and the need for different people with different mindsets and experiences when dealing with change in a complex environment.

### *Collaborative leaders*

Lewin’s model puts a large emphasis on resistance to change from employees within an organisation. This resistance to change is largely combatted by including the whole team in the change process, making sure people feel listened to, are adequately informed of the change and how it brings positive changes. Galli (2018) outlines that Lewin’s model proposes that employees must be at the heart of any change process. This is in line with reducing resistance to change. Manchester, Gray-Miceli, Metcalf, Paolini, Napier, Coogle and Owens (2014) highlighted in their case study of evidence-based practices in healthcare that the refreezing stage was very much dependent on having lower-level leadership.

### *Listen*

Listening is an aspect which works closely with collaborative leadership as it involves including employees in the change and making sure they feel they are part of the change, something which

listening can enable. LaBrosse (2009) outlines that both during the unfreezing and change steps of Lewin's model, listening plays a central role. During the unfreezing stage it is important to get everyone's input in order to present the best possible solution and change process plan. Further to this these communication lines must remain open for the duration of the change so that concerns or ideas may be shared openly. (LaBarosse, 2009)

*Draw on tacit knowledge of team members and Diversity were not addressed in the model.*

## Action-orientation

### *Envision & Execution*

Per our definition of action-orientation, we argue that there is an element of envisioning as well as execution and expert execution. Lewin's three-step model does not clearly outline the need for a common vision unlike other models (Kotter, 1996), even though it can be interpreted as communicating a vision is a part of the "unfreeze"-stage (Rosenbaum, More & Steane, 2018). He does focus on execution through the description of the "moving"-step, but lacks a more explicit description regarding how the action should be initiated. In subsequent interpretations of Lewin's model more explicit examples of steps in the second phase have been described, such as "training, explanation, and championing of new behaviours" (Muldoon, 2020, p.623).

Lewin's three-step model promotes action throughout each of the three steps. In order to implement change as Lewin's model promotes it is necessary to first gather all necessary information and create a plan with all of this available information. This plan sets a clear depiction and outlines a clear direction for the change process which can then be shared with all shareholders. This is used to motivate the change with employees. (Galli, 2019b)

As previously outlined, Lewin's model focuses primarily on reducing resistance to change, and the best way to go about this is to involve employees and stakeholders in the process, to make them feel part of the change. Galli (2018) argues that the model promotes participation in this respect as this can aid with the model's focus to reduce resistance to change. This participation by employees and other stakeholders is a clear depiction of execution as they are actively engaged in the change.

### *Expert execution*

Lewin's three-step model promotes the idea of including expert execution quite strongly. Manchester et al. (2014) found that in the case of evidence based practices in healthcare that the stage of refreezing was extremely dependent on having upper-level leadership as they served like advocates. Similarly, Galli (2018) also highlighted the need for a leading change agent or agents to lead the change as they could work with those within the organisation to iron out any issues or concerns which may arise. This highlights the facilitation of Lewin's model for expert execution to work towards a successful change implementation.

## Reflection & Observation

### *Reflection*

The last piece of our framework that we want to examine is that of reflection and observance. Just like the other four concepts, this piece was built on the arguments of several articles who all highlighted the need for being reflective and observant in a complex and ever-changing environment. Looking at Lewin's model, it could be argued that the last stage of "refreeze" to some extent raises the importance of reflection. At this stage the behaviours are frozen by ensuring that the context, which incorporates the social group and its culture, is in line with the new behaviour (Burnes, 2004a). In order to do this a certain degree of reflection needs to take place, looking at the needs of the environment. The refreezing stage is also about confirming that the performance from the change has been effective (Ford & Greer, 2006). Technically, you could argue that you also need reflection in order to "unfreeze" behaviour, because this is about meeting the individual needs in order to decrease resistance to change. However, both of these focus reflection on the individual and people of the organisation and fail to address the reflection and observance needed of the external complex environment.

### *Sensing*

Sensing refers to the transformation of observations into patterns upon reflection. Lewin's model specifically outlines an entire stage, refreezing, to embedding new changes into the organisation's culture. These changes create new patterns of action and culture for the organisation which were designed to be adopted by the change plan, a plan which was created

through reflection and consideration of the organisation's past state into the state post-change process.

*Observing and Vigilance were not addressed in the model.*

## 5.2. Kotter's Eight-Step Model & Complexity

### Innovation

#### *Non-linear thinking*

The eight-step model is built on the idea that companies should follow each step consecutively, meaning that there is an implied linearity in the model (Busse & Doganer, 2018; Connolly, Wolfgram & Santos, 2012). The model itself therefore does not encourage non-linear thinking. This linearity has been criticised by several studies (Hackman, 2017; Sidorko, 2008), suggesting that its structure is “out of step with the iterative, cyclical nature of most business environments” (Hackman, 2017, p. 15). A recent study examined the use of Kotter's eight steps during the implementation of COVID-19 screening in early days of the pandemic in the United States (Ravi et al., 2022). The researchers found evidence of different steps in Kotter's model during different times and not necessarily in the suggested order, an idea that has been supported by other recent studies based on the COVID-19 pandemic (Weiss & Li, 2020). This suggests that the individual steps in Kotter's model could still be valuable in uncertain and complex times of the modern world, but that the concept of linear thinking needs to be reviewed.

#### *View threats and opportunities as interactive*

The first step in Kotter's change model is to establish a sense of urgency. In order to do this, Kotter argues that managers should investigate the reality of the market and competition (Kotter, 1996). This involves analysing crises and potential crises as well as opportunities. This step suggests some form of focus on threats and opportunities, but lacks in the sense that they are not seen as interactive.

#### *Promote uncertainty and open-endedness*

Similar to Lewin's three-step model, Kotter's model was developed to combat uncertainty and to provide guidance and structure when dealing with change in a step-wise, sequential manner.

There is no doubt that the eight-step model supports and guides managers along every step of the way, providing a solid and workable structure (Davis, 2022; Hackman, 2017). While this is great in a predictable environment, we have shown that it is less vital in a more complex context. The model does not promote uncertainty or open-endedness and is therefore less equipped for a manager dealing with change within the frame of complexity.

*Prioritise learning was not addressed in the model.*

## Adaptability

### *Dynamic capabilities, Flexibility & Semi-structured Organisations*

Kotter's model of eight steps is described as a sequential process that needs to be completed in the right order and that all elements are equally important (Kotter, 1997). As mentioned previously, this is a very structured approach, which does not allow for much flexibility or dynamic capabilities. He does however state that the process always includes overlap between the different stages. Kotter also argues that the vision must be flexible, thus suggesting that Kotter does adhere to some elements of adaptability in his model (Kotter, 1996, p.72, cited in Sidorko, 2008).

*Agility, Nimbleness and Resilience were not addressed in the model.*

## Collaboration & Openness

### *Collaborative leaders & Draw on tacit knowledge of team members*

According to Davis (2022), Kotter's first step in his eight-step model places a significant focus on the inclusion of middle- and lower-level managers in change efforts, arguing that these will be more involved in the practical effects of the change and also be able to see and handle the needs of the employees under them. The second step in his model, creating the guiding coalition, is also geared towards collaboration as this is about creating the team that will push the change (Ikhrum, 2019). This is in line with the focus we put on being a collaborative leader in our framework, which builds on the ideas of drawing on tacit knowledge of team members and being able to really listen.

### *Diversity*

Kotter suggests that a guiding coalition should be created as change is difficult to implement alone, further demonstrating the importance of collaboration. However, one of the key reasons for creating such a group is for diversity. By forming a coalition there will be a diverse representation of knowledge and skills, far more so than when one is working alone. (Davis, 2022). This diverse set of knowledge and skills may be crucial when dealing with complex environments.

### *Listen*

The fourth step in Kotter's model is concerned with communicating the change vision. Kotter's intention for this step was not just that change would be communicated to employees, but instead that the communication channel would go both ways with the change leader both listening and being listened to (Kotter, 1996).

## Action-orientation

### *Envision & Execution*

The aspect of envisioning is evident in both the third and fourth step in Kotter's model, developing the vision and communicating the vision. He also focuses on action-orientation in the fifth and sixth step, which is to empower broad-based action and generate short-term wins. Even the last two steps, consolidating gains and producing more change as well as anchoring new approaches in the culture, are still aimed at maintaining an action-oriented mindset regarding the change, even if the new culture has already been established.

*Expert execution was not addressed in this model.*

## Reflection & Observation

### *Reflection and Sensing*

The eighth step of Kotter's model is *institutionalising new approaches*, a stage which involves setting the newly implemented changes into the routine or norm of the organisation (Appelbaum et al., 2012). These changes have been developed from an initial plan of change which was created from research on the current environment the organisation finds itself in and the steps it

must take to reach a desired outcome. This can be seen to display an initial reflection process, a process which is later solidified by the integration of these reflection-based changes into patterns and norms, an example of sensing.

*Vigilance and Observing were not addressed in this model.*

### 5.3. ADKAR & Complexity

The third and last change management model to be examined using our framework for complexity is Hiatt's (2006) ADKAR model (see Section 4.8). This model includes the five stages of awareness, desire, knowledge, ability and reinforcement, and it was developed with the intentional focus on individual progression through change, but it can also be applied to groups and organisations. In this section we will examine the ways in which the ADKAR model addresses the essential parts of our complexity framework by looking at relevant research gathered through our meta-study.

#### Innovation

##### *Non-linear thinking*

Innovation is facilitated by non-linear thinking and the ability to think outside of the box. The ADKAR model, just like Lewin's three-step model and Kotter's eight-step model, provides a structure that is based on a linear sequence that is intended to be used in the prescribed order (Jaaron, Huazi & Musleh, 2022). Even though it is possible to move between the different stages (Mellor et al., 2022), each stage facilitates the next one, implying that there is a linear structure managers will need to follow.

##### *Promote uncertainty and open-endedness*

The ADKAR model takes a linear approach to change. The model works through the five stages in order to meet a planned end goal. This end goal is highlighted by the reinforcement stage of the model. This stage works to embed change as the new normal. It is a goal-oriented model (Cronshaw et al., 2021). This end-goal counter-acts the need for uncertainty and open-endedness in the ADKAR model.



### *Prioritising learning*

Prioritising learning plays a central role to the ADKAR model. As the ADKAR model focuses on the individual there is a lot of emphasis put on the training, development and education of the employees. The knowledge step of the model is based primarily on education and training for employees (Bose, 2020), and further highlights the importance of knowledge growth and depth for this model. The model also puts emphasis on reducing resistance to change from employees. Thomas (2010, cited in Bose, 2020) highlights that to influence employee behaviour in a bid to reduce resistance to change there must be opportunities for upskilling provided.

Knowledge is also important when trying to perform new processes or enacting a change ultimately leading to innovation (Grant, 1996, cited in Bailey & Lumpkin, 2023). Studies have identified the third stage as one of the most important parts of the model, highlighting that individuals involved in an organisational change are often lacking sufficient knowledge (Al-Alawi et al., 2019; Glegg, Ryce & Brownlee, 2018). Often the knowledge that was lacking was how to implement the desired change, which is an identified weakness of the model (Al-Alawi et al., 2019). Even though there is a focus on learning, authors still criticise the ADKAR model for not focusing on innovation enough (Kazmi & Naaranaanoja, 2013).

*View threats and opportunities as interactive were not addressed in this model.*

## **Adaptability**

### *Agility*

“People rather than processes are seen as the main priority of any successful and sustainable change management approach” (Kliewe, Davey & Baaken, 2013, p.60). The ADKAR model puts great emphasis on the individual. While the aspects of adaptability should be applicable to both the individual and an organisation the ADKAR model does not put emphasis or outline a stage which should aid in developing these competencies in individuals through the use of the model. However, as seen previously with both Lewin and Kotter, the ADKAR model also impedes agility through its reinforcement stage. This stage works to embed changes (Mellor et al., 2022),

and as with Kotter and Lewin, restricts the adaptable nature of an organisation which is needed for complex environments.

*Nimbleness, Flexibility, Dynamic capabilities, Resilience, and Semi-structured organisation were not addressed in this model.*

## Collaboration & Openness

### *Collaborative leaders*

The second step in the ADKAR model, *desire*, aims to direct managers' focus towards creating conditions that can increase employees' will to participate in the change and creating a more positive perception of the change (Hiatt, 2006, cited in Jaaron, Huazi & Musleh, 2022). Managers cannot force employees to have a desire for the change to happen, but they can increase the likelihood that they will want the change by different methods, for example developing "new processes, tools and organisational structures" (Hiatt, 2006, cited in Al-Alawi et al., 2019). By highlighting the individual desire to take part in the change, the model also places a certain focus on having a collaborative mindset. Collaboration and openness can play a crucial role in dealing with change in a complex environment. The ADKAR model includes a number of aspects which promote a collaborative and open environment. Collaboration is aided by having collaborative leaders. Hiatt (2006) highlights a number of factors which must be present in order for his model to be successful, one of which is having an initial credible sender of the message to instigate awareness of the change (Jaaron, Huazi & Musleh, 2022). This person may be viewed as a collaborative leader as they are an initial point of contact to get all involved in the change. This role may be an officially recognised leadership role or unofficially recognised by those involved in the change.

### *Listen*

However, an alternative way to look at the second step of desire is that it's less about being collaborative and more about controlling the attitudes of the people in the organisation. Managers cannot force people to want the change and many individuals have negative perceptions of change (Al-Alawi et al., 2019). Instead of trying to create conditions for employees in order to push them to want the change, maybe the model should focus more on the

listening aspect of our framework. If managers spent more time listening to the desires of their employees, maybe they would find that the change they want to implement is no longer relevant or that there are ways in which the change can be aligned closer to the desires of the people in the organisation.

*Draw on tacit knowledge of team members and Diversity were not addressed in this model.*

## Action-orientation

### *Execution*

According to Hiatt (2006), the “ability” step in his model deals with the actual change happening (Al-Alawi et al., 2019). This is supported by Pawl and Anderson (2016), who describe ability as “the action piece of the change process (p.237). Other researchers take a more holistic perspective, viewing the full ADKAR model as an action plan when trying to initiate and follow through a change (Ikhrum, 2018). Taken together this suggests that the model does have a significant focus on being action-oriented and executing change, although it has been criticised for not including more concrete instructions on how to implement the change (Al-Alawi et al., 2019). The second step of the model refers to desire which is used as an agent to make people excited or invested in the change. This in turn supports participation in the change process which aids a successful implementation (Mellor et al., 2022).

*Envision and Expert execution were not addressed in this model.*

## Reflection & Observation

### *Reflection & Observing*

The awareness part of the model is geared towards observance and reflection, however, it could be argued that the focus lies on internal awareness within the organisation and not the external one. Hiatt (2006) describes awareness as being based on a person’s view of the current state and not necessarily being observant to external changes (cited in Jaaron, Huazi & Musleh, 2022). In Bailey & Lumpkin (2021) they explain awareness as being able to be alert of current conditions and recognising future opportunities, continuing with stating that the awareness of stakeholders of their environment becomes a context for identifying opportunities.

*Sensing and Vigilance were not addressed in this model.*

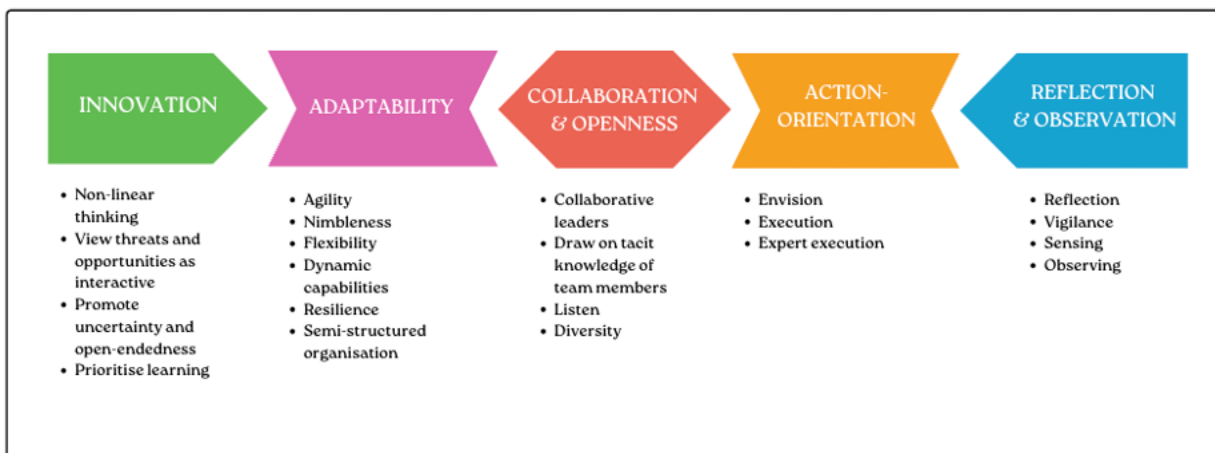
#### 5.4. Aspects not addressed

There were several aspects of our five concepts that we could not find any information on to be able to determine whether they were addressed or not. These have been highlighted in each section. We discussed between us how this should be addressed in the study and in the framework, and came to the conclusion that it is better to leave these aspects out rather than trying to apply them in cases where they are actually not relevant. If we had tried to fit them into each concept in the framework there would be a risk of us drawing invalid conclusions. Therefore, for anyone else using our framework, we recommend leaving out the aspects not covered in order to get as accurate of a measurement as possible.

## 6. DISCUSSION & CONCLUSION

### 6.1. Summary of findings & application

This study was designed to help us evaluate the relevance of traditional change management models. In order to fulfil our purpose we needed to achieve three objectives: 1) create a framework to evaluate change management models in the context of a complex environment, 2) get an overview and deeper understanding of traditional change management models and 3) evaluate traditional change management models using the framework we created. In line with our first objective we were able to create a framework based on five components needed to facilitate change in the face of complexity. These five components were innovation, adaptability, collaboration and openness, action-orientation and lastly, reflection and observation. Within each component we were also able to identify a number of aspects that were important with respect to each component. These are summarised in the figure below.



*Figure 10. Summary of Five Pieces of Operating Within Complexity Framework*

In order to complete the second objective of this study, we needed to find models that were considered traditional and we needed to do a literature review on these models. After an initial search through literary articles and subsequent discussion, we found several references to Lewin's three-step model, Kotter's eight-step model and Hiatt's ADKAR model as being considered traditional in the field of change management. This eventually led us to the decision to only look at these three models and we did this by conducting a literature review on articles

written about these models. The aim was to gain a better understanding of not only what they were constructed to do, but what underlying assumptions they were based on as well as their individual strengths and weaknesses. This understanding that we gained and presented through our literature review provided the basis for our analysis, which was to apply our framework on our findings.

The final part of this study and the third objective was to apply our framework and we did this by critically examining each of the aspects of the five overarching components in the framework on each of the three change management models. The results of these are summarised as follows:

#### 6.1.1. Lewin's three-step model

For Lewin's three-step model, we saw a lack of innovation due to linear thinking and the promotion of certainty and predictable outcomes. Although the model does prioritise learning, we don't see enough examples of innovation in this model and therefore reach the conclusion that **the model does not sufficiently meet the criteria for innovation**.

We also saw a significant lack of adaptability since Lewin's third step places a significant focus on re-stabilising the system, which goes against the different aspects of adaptability. Although one study argued that the refreezing stage can be interpreted as flexible (Jarvis & Ortega, 2010), we maintain that this is more of a post-construction of the model rather than looking at the assumptions it was built on. Nimbleness and resilience were two factors of adaptability that we did not find any information on to make an assessment. All in all, **the model does not meet the criteria for adaptability**.

Third, Lewin's model as well as the assumptions it was built on places a strong focus on social processes and collaboration between individuals. He could have highlighted the importance of diversity more in his model, especially since this was something he was personally quite passionate about. Taken together, we argue that **the model fulfils the criteria for collaboration and openness**.

The same goes for the fourth concept, action-orientation, which we argue there is a sufficient focus on in his model, although it sometimes gets overlooked by the unfreezing and freezing stages. Lewin puts a strong emphasis on participation and also on resistance to change. It is this focus which guides the aspects of action-orientation as promoting participation in the change can help to reduce resistance to change. As Lewin's model demonstrates all of the aspects for this element **it can be concluded that the requirements for action-orientation are met.**

Lastly, Lewin's third step of freezing exemplifies some aspects of reflection and observation. We argue that there is a need for more focus on external forces to the organisation to completely fulfil the requirements of this component. Two of the components, vigilance and observing, do not appear to be addressed or considered with Lewin's model in any significant respect. While other aspects of reflection are touched upon and can be argued for to a certain degree, they are ultimately not evident enough for dealing with complex environments. Due to the lack of evidential support **the model does not meet the requirements for reflection and observation.**

#### 6.1.2. Kotter's eight-step model

Firstly, Kotter himself placed a strong emphasis on the sequential linearity of his model and its aim of decreasing uncertainty, which is not compatible with the concept of innovation. He also touches upon the importance of looking at threats and opportunities, but not enough to meet the requirements of this framework. We could not find any information on prioritising learning. This led us to the conclusion that **the model does not sufficiently meet the criteria of innovation.**

Secondly, the aspects of adaptability are not evident in Kotter's model since he has been adamant about the need to complete all of his eight steps in order and that skipping ahead most often leads to failure of the change (Kotter, 1997). He addresses some elements of flexibility when describing the vision, but this is not comprehensive and therefore we conclude that **the model does not meet the criteria for adaptability.**

Much like Lewin, Kotter does however place a significant focus on *collaboration and openness* in his model. This is evident in multiple steps in the model. For example, he highlights the need for diversity in terms of experience, knowledge and position in his second step that is aimed at

building a guiding coalition, therefore fulfilling the aspect of diversity. He also emphasises that communication is two-sided, particularly in step four. This led us to conclude that **Kotter's model meets the criteria for collaboration and openness**.

The fourth component is about focusing on being driven towards action, a component that is increasingly more important as changes are happening at a rapid speed. This is clearly evident in Kotter's model since he places a significant focus on creating and communicating the vision as well as enabling the change to occur. He could have been more explicit in how the implementation could happen and also consider the value of experts in executing the change. All in all, we conclude that **the model meets the criteria for action-orientation**.

Lastly, there is a significant lack of reflection in Kotter's model as it deals more with explaining the aspects of the change and not on what to do to reflect on the change after it has been consolidated. We also did not find any information on remaining vigilant, sensitive or observant in the studies of our sample. There is also a lack of *reflection and observation* on the external environment influencing the changes in the organisation. Therefore we concluded that **the model did not meet the criteria for reflection and observation**.

### 6.1.3. The ADKAR model

Just like previously discussed models, the ADKAR model does not meet the criteria for non-linear thinking due to its linear structure. It also does not promote uncertainty and open-endedness because it assumes that change has a clear beginning and end. However, the model places a significant focus on inquiry and the gaining of new knowledge through prioritising learning, which is a considerable strength to the model. This aspect of ADKAR led us to conclude that the model **sufficiently meets the criteria for innovation**.

Furthermore, the concept of adaptability is limited by not only the emphasis of the sequential, linear structure but also on the emphasis of the reinforcement stage in ADKAR. The model does not take into account the risk of new changes having to be implemented and that the reinforcement stage may never be reached. There was a considerable lack of most of the aspects



of adaptability when we examined the ADKAR model, which led us to conclude that **the model does not sufficiently meet the criteria for adaptability**.

The third concept is collaboration and openness and we identified a number of different aspects that would argue for the model adhering to this concept. For example, there is a significant focus on the individual and their knowledge and desires, which shows that the model wants leaders to focus on meeting the needs of the people taking part in the change. However, the aspect of listening could be more explicit in the model, especially since it is important in order to build conditions that meet the team members' desires. There was also a lack of information that would support the ideas of drawing on tacit knowledge of team members as well as diversity. Nevertheless, we gathered that **the model sufficiently meets the criteria for collaboration and openness**.

The significance of being action-oriented is highlighted in the “ability-step” of the ADKAR model (Al-Alawi et al., 2010). Taken as a whole, the model can also be viewed as being very actionable (Ikhrum, 2018). Although the concepts of envision and expert execution were not explicitly mentioned, we concluded that **the model sufficiently met the criteria for action-orientation**.

With the focus on raising awareness of the reasons behind the change, the ADKAR model does encourage reflection and observation. The last step of reinforcement could also be seen as a sort of reflection on what the new change actually means for the involved parties. We would however have liked to see more evidence of vigilance and sensing in the application of ADKAR, but we asserted that **the model sufficiently meets the criteria for reflection and observation**.

The results of the application of our framework (Chapter 5) are summarised in the table below.

	<b>LEWIN 3-STEP</b>	<b>KOTTER 8-STEP</b>	<b>ADKAR</b>
<b>Innovation</b> Non-linear thinking View threats & opportunities as interactive Promote uncertainty & open-endedness Prioritise learning	✗	✗	<input checked="" type="checkbox"/> <i>To some extent</i>
<b>Adaptability</b> Agility Nimbleness Flexibility Dynamic capabilities Resilience Semi-structured organisation	✗	✗	✗
<b>Collaboration &amp; Openness</b> Collaborative leaders Draw on tacit knowledge of team members Listen Diversity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Action-orientation</b> Envision Execution Expert execution	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Reflection &amp; Observation</b> Reflection Vigilance Sensing Observing	<input checked="" type="checkbox"/> <i>To some extent</i>	✗	<input checked="" type="checkbox"/> <i>To some extent</i>

Table 4. Summary of analysis

## 6.2. Evaluation of framework

### *Pros*

For the frame of this study, we asked the question: Are traditional change management models still relevant in a context characterised by complexity? To answer this question, we created a framework that would allow us to highlight important dimensions and assumptions in the change management models selected for this study. Our framework was able to meet the aim of our study and provided us with a valuable tool to evaluate the relevance of the models.

An interesting finding after we had created our framework for complexity was that there were several articles used in the literature review for the traditional models who highlighted the need for some of the concepts that we discussed in the framework (Burnes, 2004b; Weick, 2000, cited in Burnes & Cooke, 2012; Weick & Quinn, 1999; Naude, Dickie & Butler, 2012). For instance, Burnes (2004b) evaluated the implications of complexity on organisational change by looking at the writings of complexity theorists and emphasised the importance of innovation, diversity, semi-structures, learning and flexibility. Weick (2000) argued that the added benefits of emergent change are:

“...sensitivity to local contingencies, [...] learning, and sensemaking; [...]; proneness to swift implementation; resistance to unravelling; ability to exploit existing tacit knowledge; and tightened and shortened feedback loops from results to action” (Weick, 2000, p.227, cited in Burnes & Cooke, 2012, p.1408)

Weick and Quinn (1999) also call attention to the need to “reframe issues as opportunities”, be “resilient to anomalies, and more flexible in [...] execution” (p.379-380). Lastly, Naude, Dicke & Butler (2012) highlight the accelerating speed at which the world is developing in the 21st century, and go on to argue that “these demands require speed, flexibility, ongoing renewal, legislative changes, organisational changes such as mergers, acquisitions, restructuring and retrenchment” (p.9). Taken together, we can see that the themes used in our framework are not new to researchers in the field and that we are not the only ones recognising this need. We are, however, the first to put together a comprehensive framework on what is needed in order to

facilitate change in a complex environment, which is intended to be used to evaluate change management models based on their relevance in tackling issues in the context of complexity.

Since our framework has only ever been used to evaluate the relevance of Lewin's three-step model, Kotter's eight-step model and the ADKAR model in a complex environment, we cannot determine whether the framework could be valuable in a different context. For example, it's possible that our framework is transferable to evaluating business models or strategy and that it can be used to determine what factors are missing. It's also possible that the framework could be used as a complementary framework while an organisation implements a change management model. This is something we encourage future research to investigate.

### *Cons*

Through our test application, we can see that the framework can be used to determine relevance for complex environments based upon our elements, and as an initially unintended bonus can also serve as a guide to the change agent on missing aspects which are necessary to consider. The aspects which remain unaddressed or are hindered by the model may serve as a checklist or starting point for the change agent to implement. However, although these gaps in the model will be identified and necessary adjustments have to be considered, our model does not offer any specific guidance or instruction for the change agent on how to implement or include these aspects.

The framework is an interpretive model, meaning someone may look at the same models that we used and interpret the elements of our framework differently. This could result in different aspects being included or excluded, and therefore could also impact to what extent relevance is determined. This makes the possibility for disparities high. There were a certain number of aspects for the different models in which we struggled to find evidence that either supported or restricted the aspects of our model for change in the face of complexity. This led us to determine whether this model was or was not relevant in a complex environment. However, using our framework someone else could come to a different conclusion and the determination may be the reverse.

In Section 3 we discussed our framework as a projection as it had not yet been tested. Through our application, we can see that the framework is functional. However, this does not mean that it comes without trials or difficulties. Through our own application, it was obvious to us that at times it was difficult to interpret if a model clearly or fully met the criteria for an aspect or element. We had to call upon the knowledge we have gained from an extensive study on the area of change management and complexity as not all the information which would guide the determination of relevance was obvious to us. This could result in a situation in which someone who is inexperienced in the field of change management may find it difficult to read and interpret the underlying mechanisms and assumptions of the model they are looking at in order to evaluate the relevance in a complex environment.

In addition to difficulties which may be faced in implementing some of the aspects in relation to complexity and change management, we also recognise how extensive the framework is. Coming in at twenty-two individual aspects belonging to five different elements, the body of work which needs to be completed to determine relevance may be too substantial for some change agents. This may be of particular relevance in the case where our framework is used to determine the most relevant model from a selection of models, all of which will need to be applied to the framework individually.

Throughout the application of our framework to the three chosen models it became clear to us that, based on our judgement, none of them fulfilled all five elements in order to be determined as relevant in a complex environment. This raised the question if there would be any model which would complete every aspect of the framework, and could therefore be determined as entirely relevant. This could have two implications, a) that our framework may not be as applicable or useful as we had initially believed, and b) that our framework can be utilised to make the agent more aware and conscientious of implementing the change process and instead offer an informed decision for the best option rather than an ultimate option.

Lastly, it may be argued that not all changes need to fulfil all elements or aspects of our framework. Change can be implemented for a wide range of reasons. It is possible that there will

be a change process that does not require every aspect of our framework, and therefore our framework in its current form would be of little or no use to a change agent in such a situation.

### 6.3. Conclusion

Through the use of our developed framework, and contained within its scope, we have explored the relevance of the traditional change management models in question, which are Lewin's three-step model, Kotter's eight-step model, and ADKAR model. This framework enabled us to investigate if each of the models incorporated the five elements necessary for implementing change in a complex environment which we identified.

Lewin's three-step model was studied against this framework. The presence or lack of particular aspects belonging to each element allowed us to determine if Lewin's model had met any of the criteria for relevance in a complex environment. Lewin's model displayed the presence of two of the five elements, these being collaboration and openness and action-orientation. However, Lewin's model failed to find enough relevance for innovation and adaptability. There was a certain degree of reflection and observation displayed. This also means that Lewin's model met less than half of the requirements. For this reason, **we do not believe Lewin's three-step model is entirely relevant in a complex environment.** However, this does not mean Lewin's model should be ignored completely. Lewin's model displayed positive attributes and support for a number of aspects of our model, and so still holds a certain degree of relevance. It is possible with extra considerations and possibly adaptations to the model's current form it still has the potential to be of use in a complex environment.

The second model to which we applied our framework was Kotter's eight-step model. From our analysis of this model against our five elements we found that Kotter's model fulfilled the criteria for two of the elements of our framework. Interestingly these two elements were collaboration and openness and action-orientation, the same elements which Lewin's model also displayed. Kotter's model failed to display a high enough inclusion of innovation, adaptability, and reflection and observation. This means, by meeting the criteria for just two-fifths of the necessary elements for working within complexity, **we believe Kotter's model is not relevant**

**for change management in a complex environment.** As was previously outlined with Lewin, there is a possibility for Kotter's model to be adapted or for a change agent to implement additional features to a change process which could aid its use in a complex environment. However, as the lowest-scoring model of the three, we believe that is of the least relevance overall.

The third, and final, model which we evaluated was the ADKAR model. This model is the most recently developed of the three models studied. From our evaluation we found that the model was relevant in terms of both collaboration and openness and action-orientation. It was also deemed to display partial relevance for innovation and reflection and observation. The only element which it was deemed not relevant was adaptability. Based on our analysis and these results **we believe the ADKAR model is the most relevant of the studied traditional models of change management.** The model is not entirely relevant as some aspects, and one element, are missing. However, in the comparison of the three models, ADKAR had the most positive result.

Interestingly, all three of the models displayed the same result for three of the elements. Each model was evaluated as not relevant for adaptability. Further to this, each model did display relevance for collaboration and openness and action-orientation. As the prevalence, or lack thereof, of three elements was consistent in each of the models it may be argued that a preliminary conclusion may be drawn that this is a characteristic evident in traditional change management models. However, as this study is limited to just three models no formal conclusion can be drawn from this at the current time and a further study of a large sample of models would be needed to determine this.

In conclusion, we believe that the three traditional change management models studied, while offering varied results, are not relevant in a complex environment. As previously outlined, it is possible for these models to be adapted or supplemented to fulfil the missing criteria, but in their current form and in relation to the scope of our developed framework they do not meet the criteria for relevance for change in the face of complexity. While we cannot draw a definitive answer for all traditional models which we have not studied, we argue that other traditional

models which share similar characteristics to our studied models would result in similar conclusions. This may be particularly relevant if the models are related to, inspired by, or developed from Lewin's model, as both Kotter and ADKAR were.

## 6.4. Implications

To date, there is no framework like the one we have created. This makes our contribution unique and significant as it has the potential to help future managers and researchers in their process of evaluating change management models in complex environments. Through our research, we have noticed that there are strong arguments both for why these models are still relevant as well as for why they should be discarded (Burnes, 2020; Edgehouse et al., 2007, cited in Al-Alawi et al., 2019; Sidorko, 2008). For example, Sidorko (2008) asks the question "why so many models for organisational change exists, particularly as many share common features" (p.308). He goes on to argue that the "extensive range of models is no doubt in response to the need for a unique approach required for changes processes" (p.308). This is the view that we also take and that there is likely no "one-size fits all" when it comes to change management as the needs and requirements for the change are so incredibly different depending on the contexts (Sidorko, 2008, p. 316). When we set out to do this research we came from a critical perspective, and although we found a lot of support for why these models are not as relevant, we were also surprised to learn to what extent they have provided guidance for change managers and how they are still valuable in less complex settings. We don't encourage managers to completely discard these models, but instead to be cautious of their limitations to deal with complexity as we have demonstrated in this study. To combat this, we hope that our framework can serve as a valuable tool to help facilitate change in an environment of complexity.

## 6.5. Future research

Time, resources and knowledge were all variables that limited the scope of this study. Therefore, it would be interesting to see what future research could find by implementing our framework, particularly in a setting that is less theoretical and more empirical. For example, future research could evaluate the practical relevance of our framework using a case study. In addition, we only looked at three traditional change management models and therefore future research could



investigate more contemporary models who might be more relevant in a complex environment or even look at the comparison of both traditional and contemporary models. Lastly, since we based the different elements of the five pieces in our framework on our individual perceptions and they tended to overlap, future research could test whether the aspects that we have assigned to each concept is actually under the right category. This could generate conclusions that are different to the ones we have drawn in this study.

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# Appendix A

Articles used when we built our framework

Complexity piece	Relevant articles
Innovation	Higgs & Rowland, 2005 Straub, 2013 Kail, 2013 Uhl-Bien & Arena, 2018 Waddock et al., 2015
Adaptability	Burk, 2020 Poblador Waddock et al., 2015 Uhl-Bien & Arena, 2018 Karp & Helgø, 2009 Chinoperekweyi, 2020
Collaboration & Openness	Kail, 2013 Lawrence, 2015 Kerber & Buono, 2005 Worley & Mohrman, 2014 Waddock et al., 2015 Sullivan, 2011
Action-orientation	Higgs & Rowland, 2005 Kotter, 2007 Poblador, 2014
Reflection & Observance	Lawrence, 2015 Waddock, 2015 Higgs & Rowland, 2005 Worley & Mohrman, 2014 Uhl-Bien & Arena, 2018

# Appendix B

Overview of key terms used to build framework

<b>Concept</b>	<b>Article (page number)</b>
Nimbleness	Burk (2)
Being vigilant	Worley & Mohrman (217)
Observing	Higgs & Rowland (125)
Sensing	Higgs & Rowland (125)
Envisioning	Higgs & Rowland (125)
Executing	Higgs & Rowland (125)
Learn from and build on diversity	Worley & Mohrman (217)
Sensitivity to different sub-cultures and market contexts	Worley & Mohrman (217)
Courage to listen	Lawrence (239)
Being a "reflective device"	Lawrence (250)
Draw on the tacit knowledge and capabilities of organizational members	Kerber & Buono (31)
The role of the leader is to accept and even promote uncertainty, surprise, unknowability, and open-endedness	Uhl-Bien & Arena (95)
Need to position organizations as "semistructured" rather than over-structured	Uhl-Bien & Arena (95)
Agility	Chinoperekweyi (20)
Innovation	Chinoperekweyi (20)
Appreciate your location in a broader system, and engage in networks and collaborations of organizations	Waddock (1003)
Constant innovation	Waddock (1005)
Continous reflection	Waddock (1005)

Prioritize learning	Waddock (1006)
"With an eye to emergence"	Waddock (1007)
Creating ad hoc opportunities to support emergence of multiple possibilities	Waddock (1007)
Valuing diversity	Waddock (1007)
Emphasize resilience and adaptation	Waddock (1007)
Built in flexibility	Poblador (n.d)
Expert execution	Poblador (n.d)
Dynamic leadership	Poblador (n.d)
Dynamic capabilities	Poblador (n.d)
Cognitive diversity	Sullivan
Lower casue and effect thinking	Sullivan
Non-linear	Straub
Non-linaer	Kail
View threats and opportunities as interactive	Kail
Develop collaborative leader	Kail

# Appendix C

Search results for the three chosen change management models

## *SCOPUS*

Search words	Limited to	No. results
“Lewin” AND “change”	‘Business, management and accounting’, ‘English’	151
“three step model” AND “change”	‘Business, management and accounting’, ‘English’	12
“three stage model” AND change”	‘Business, management and accounting’, ‘English’	28
“unfreeze and refreeze” AND “change”	‘Business, management and accounting’, ‘English’	7
“Lewin” AND “three step model” AND “change”	‘Business, management and accounting’, ‘English’	5
“Lewin” AND “three stage model” AND “change”	‘Business, management and accounting’, ‘English’	3
“Kotter” AND “change”	‘Business, management and accounting’, ‘English’	75
“eight step model” AND “change”	‘Business, management and accounting’, ‘English’	5
“Kotter” AND “eight step model” AND “change”	‘Business, management and accounting’, ‘English’	4
“Kotter” AND “8 step model” AND “change”	‘Business, management and accounting’, ‘English’	0
“8 step model” AND “change”	‘Business, management and accounting’, ‘English’	0

“ADKAR” AND “change”	‘Business, management and accounting’, ‘English’	22
“ADKAR”	‘Business, management and accounting’, ‘English’	22

***BUSINESS SOURCE COMPLETE***

<b>Search words</b>	<b>Limited to</b>	<b>No. results</b>
“Lewin” AND “change”	‘Peer reviewed’, ‘English’	127
“three step model” AND “change”	‘Peer reviewed’, ‘English’	9
“three stage model” AND change”	‘Peer reviewed’, ‘English’	17
“unfreeze and refreeze” AND “change”	‘Peer reviewed’, ‘English’	9
“Lewin” AND “three step model” AND “change”	‘Peer reviewed’, ‘English’	3
“Lewin” AND “three stage model” AND “change”	‘Peer reviewed’, ‘English’	0
“Kotter” AND “change”	‘Peer reviewed’, ‘English’	42
“eight step model” AND “change”	‘Peer reviewed’, ‘English’	3
“Kotter” AND “eight step model” AND “change”	‘Peer reviewed’, ‘English’	1
“Kotter” AND “8 step model” AND “change”	‘Peer reviewed’, ‘English’	0
“8 step model” AND “change”	‘Peer reviewed’, ‘English’	0
“ADKAR” AND “change”	‘Peer reviewed’, ‘English’	18
“ADKAR”	‘Peer reviewed’, ‘English’	21

***WEB OF SCIENCE***

<b>Search words</b>	<b>Limited to</b>	<b>No. results</b>
“Lewin” AND “change”	‘6.3 management’, ‘English’	109
“three step model” AND “change”	‘6.3 management’, ‘English’	9
“three stage model” AND change”	‘6.3 management’, ‘English’	24
“unfreeze and refreeze” AND “change”	‘6.3 management’, ‘English’	7
“Lewin” AND “three step model” AND “change”	‘6.3 management’, ‘English’	0
“Lewin” AND “three stage model” AND “change”	‘6.3 management’, ‘English’	0
“Kotter” AND “change”	‘6.3 management’, ‘English’	23
“eight step model” AND “change”	‘6.3 management’, ‘English’	2
“Kotter” AND “eight step model” AND “change”	‘6.3 management’, ‘English’	1
“Kotter” AND “8 step model” AND “change”	‘English’	0
“8 step model” AND “change”	‘English’	0
“ADKAR” AND “change”	‘6.3 management’, ‘English’	7
“ADKAR”	‘6.3 management’, ‘English’	8

*APA PSYCINFO*

<b>Search words</b>	<b>Limited to</b>	<b>No. results</b>
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“Lewin” AND “change”	‘Peer reviewed’, ‘English’, ‘organisational change’, ‘social change’, ‘intervention’, ‘organisational development’, ‘social psychology’, ‘action research’, ‘experimentation’, ‘organisational behaviour’, ‘group dynamics’, ‘leadership’, ‘psychologists’, ‘decision making’, ‘models’, ‘motivational interviewing’, ‘attitude change’, ‘methodology, organisations’, ‘theories’, ‘behaviour change’, ‘business organisations’, ‘innovation’, ‘management methods’, ‘organisational climate’, ‘professional personnel’, ‘democracy’, ‘demographic characteristics’, ‘management’, ‘motivation’	109
“three step model” AND “change”	‘Peer reviewed’, ‘English’	9
“three stage model” AND change”	‘Peer reviewed’, ‘English’	24
“unfreeze and refreeze” AND “change”	‘Peer reviewed’, ‘English’	7
“Lewin” AND “three step model” AND “change”	‘Peer reviewed’, ‘English’	0
“Lewin” AND “three stage model” AND “change”	‘Peer reviewed’, ‘English’	0
“Kotter” AND “change”	‘Peer reviewed’, ‘English’	23
“eight step model” AND “change”	‘Peer reviewed’, ‘English’	2
“Kotter” AND “eight step model” AND “change”	‘Peer reviewed’, ‘English’	1
“Kotter” AND “8 step model” AND “change”	‘Peer reviewed’, ‘English’	0
“8 step model” AND “change”	‘Peer reviewed’, ‘English’	0
“ADKAR” AND “change”	‘Peer reviewed’, ‘English’	7

“ADKAR”	‘Peer reviewed’, ‘English’	8
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# Appendix D

## Lewin's Three-Step model

<p><b>Articles included:</b></p> <p>Adam, 2022; Jarvis &amp; Ortega, 2010; Levasseur, 2015; Schein, 1996; Burnes, 2004b; Burnes, 2004c; Burnes &amp; Cooke, 2012; Burnes, 2020; Lewin, 1947; Cummings, Brigdman &amp; Brown, 2016; Marshak, 1993; Johnson et al., 2016; Crosby, 2022; Boak, 2021; Bartunek &amp; Woodman, 2015; Pregmark, 2022; Davis &amp; Taylor, 1976; Burnes 2004a; Bose, 2020; LaBrosse, 2009; Ford, 2009; Wan, Saade &amp; Wang, 2020; Mangaliso et al., 2021; Galli, 2018; Galli, 2019a; Galli, 2019b; Manchester et al., 2014; Bakari, Hunjra &amp; Niazi, 2017; Ford &amp; Greer, 2006; Levasseur, 2001; Motamedi, 2007; Muldoon, 2020; Richardson, Corbitt &amp; Ling, 2009; Rosenbaum, More &amp; Steane, 2018; Santos et al., 2023; Weick &amp; Quinn, 1999; Elrod &amp; Tippett, 2002</p>
<p><b>Total # of articles: 37</b></p>

### *Excluded articles*

	Article	Reason for exclusion
1.	Anghel, 2018	Does not include Lewin's 3-step model
2.	Buchanan et al., 2005	Only include a short paragraph on Lewin and his 3-step model
3.	Cooke, 1999	This article claims that early change management literature is built on politically left values, and is not strictly relevant
4.	Mangaliso et al., 2021	Implementing indigenous values to change management
5.	Manchester et al., 2014	Retrofitting of the model - not working with complexity
6.	LaBrosse, 2009	Only briefly outlines the steps of model
7.	White, 2006	Does not sufficiently mention Lewin

8.	Scherpereel & Lefebvre, 2006	Do not sufficiently mention Lewin
9.	Scharmer & Kaeufer, 2010	Do not sufficiently mention Lewin
10.	Quiroz-Flores & Collao-Diaz, 2022	Do not sufficiently mention Lewin
11.	Haleem, 2015	Was not perceived as academic or serious enough
12.	Barnett, 1986	No access
13.	Al Remeithi & Ahmad, 2020	No access
14.	Azalanazllay & Halim-Lim, 2020	Do not sufficiently mention Lewin
15.	Hussan et al., 2018	Do not sufficiently mention Lewin
16.	Meyer & Stensaker, 2007	Do not discuss Lewin
17.	Endrejat, Baumgarten, Kauffeld, 2017	Do not use Lewin's three-step model
18.	Schein & Schein, 2017	Do not sufficiently mention Lewin
19.	Talmaciu, 2014	Does not sufficiently mention Lewin in the context of our study
20.	Zand & Sorensen, 1975	Focuses on Lewin in terms of management sciences and does not sufficiently mention Lewin in the context of our study
21.	Lindgreen, Di Benedetto & Pieters, 2023	Do not sufficiently discuss Lewin

22.	Okumus & Hemmington, 1998	Do not sufficiently discuss Lewin for the context of our study
23.	Okumus & Hemmington, 1998	Duplication of chosen article
24.	Taylor III, Hills & Davis, 1979	No access
25.	Memon, Shah & Khoso, 2021	No access
26.	Duffy, 2023	No access
27.	Lobo et al., 2022	Not relevant enough
28.	Medley & Akan, 2008	A case study using Lewin's model but without evaluation of the model itself
29.	Paquibut & Naamany, 2019	Emphasis on a case study with an insufficient discussion on Lewin for this context
30.	Woodward & Hendry, 2004	Do not sufficiently mention Lewin
<b>Total # of articles excluded:</b>		<b>30</b>

## Kotter's Eight-Step model

<p><b>Articles included:</b> Hughes, 2016; Clay, 2017; Wan, Saade &amp; Wang, 2020; Appelbaum et al., 2012; Farkas, 2012; Pollack &amp; Pollack, 2014; Stragalas, 2010; Nitta et al., 2009; Jiang, 2020; Davis, 2022; Busse &amp; Doganer, 2018; Connolly, Wolfgram &amp; Santos, 2012; Hackman, 2017; Kotter, 1997; Naude, Dickie &amp; Butler, 2012; Ravi et al., 2022; Sidorko, 2008; Weiss &amp; Li, 2020</p>
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**Total # of articles: 18**

*Excluded articles*

	<b>Article</b>	<b>Reason for exclusion</b>
1.	Mathuva, 2014	Does not mention Lewin sufficiently enough
2.	Du Plessis, 2012	No access
3.	Tudor, 2014	No access
4.	Reema et al., 2021	No access
5.	Groves, 2018	No access
6.	Toktay, Selhat & Anderson, 2006	No access
7.	Springer & Clark, 2007	No access
8.	Eriksson & Fundin, 2018	Focuses on visual management tools
9.	Kotter, 2001	Only a discussion on leadership vs. management and not on his eight-step model
10.	Wentworth, Behson & Kelley, 2020	Case study which did not have sufficient mention of the model
11.	Malagas et al., 2013	Case study with no extra sufficient discussion of Kotter
12.	Watts, Cuellar & O'Sullivan, 2008	Case study with no extra sufficient discussion of Kotter
13.	Kotter & von Ameln, 2019	Interview with no sufficient extra information

14.	Malaga, Koppel & Dervishi, 2021	Case study with no extra sufficient discussion of Kotter
15.	Caulfield & Brenner, 2019	Case study with only outline of the model included
16.	Reissner, Pagan & Smith, 2011	Focuses on two novels with a brief outline of model
17.	Bradutanu, 2012	No access
18.	Baloh, Zhu & Ward, 2017	Not extra sufficient information provided
19.	Sittrop & Crosthwaite, 2021	Case study, model not expanded on sufficiently
20.	Crain et al., 2021	Do not evaluate Kotter's model
<b>Total # of articles excluded:</b>		<b>20</b>

## The ADKAR model

<p><b>Articles included:</b> Jaaron, Huazi &amp; Musleh, 2022; Bose, 2020; Kliewe, Davey &amp; Baaken, 2013; Lowery, 2010; Mellor et al., 2022; Kazmi &amp; Naarananoja, 2013; Pawl &amp; Anderson, 2016; Al-Alawi et al., 2019; Cronshaw, Boddy &amp; Reilly, 2021; Bailey &amp; Lumpkin, 2023; Glegg, Ryce &amp; Brownlee; Ikhran, 2018</p>
<b>Total # of articles: 12</b>

### *Excluded articles*

	<b>Article</b>	<b>Reason for exclusion</b>
1.	Jones-Schenk, 2019	No access

2.	Quyem, 2019	No access
3.	Karambelkar & Bhattacharya, 2017	No sufficient additional information
4.	Kazmi & Naarananoja, 2019	No access
5.	Lehman, 2020	No access
6.	Kliewe, Davey & Baaken, 2013	No access
<b>Total # of articles excluded:</b>		<b>6</b>