What organizations most commonly encounter during agile adoption and how it is managed.

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A research report submitted to Auckland University of Technology in partial fulfilment of the requirements for the degree of the Master of Information Technology Project Management (MITPM).

Abstract

Many organizations have started transitioning into agile methods using agile adoption. This is because agile is becoming a mainstream method in the software industry (F. Maurer and G. Melnik, 2006). So I began a search for the different materials that are available for me to learn more about agile adoption more specifically Scrum due to it being one of the most used agile methods in New Zealand (Licorish S. A., 2016). I have decided to do a multi-vocal literature review (MLR) for my study so I can further understand the complexities surrounding Scrum adoption from a researcher's perspective. This will be done by searching through articles to understand both the issues and uncertainties that organizations experience when adopting agile and also the success factors and the strategies that are used to manage these to benefit them or to ensure that they do not negatively affect the process. The findings present that there are many issues and uncertainties that organizations run into but also plenty of strategies that have been discovered over the years to manage them as long as these strategies are used correctly. The most commonly mentioned issue and uncertainty was poor communication but with the strategy of being transparent, this can help with the poor communication in an organization.

Acknowledgements

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person, nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning, except where explicitly defined in the references and acknowledgements.

Signed:

_CS Tanford_____   Date: __12/11/21__

Ethical Considerations of the Study

The ethical implications of this study were considered and as it was [an investigation involving document analysis from secondary sources/an experiment not involving humans] no ethics approval was sought for the study.

Introduction

Many organizations have started transitioning into agile methods using agile adoption. This is because agile is becoming a mainstream method in the software industry (F. Maurer and G. Melnik, 2006). The issues I have read that most organizations don't prepare enough for the adoption or they don't have a method to adopt to an agile method of some sort (Jignya Patel & Robin Poston (2021)). So I have decided to investigate the issues and uncertainties that have taken place with these organizations and try to uncover what could have been done differently. In some cases they could have followed a method but the team was not on board to adapt to change but in others the team was keen for adoption but didn't follow a method correctly (Jignya Patel & Robin Poston (2021)). These are two possible ways that organizations could fail in the adoption process so it's important to discover what makes or breaks an organization when implementing these adoptions.

There are many methods out there that have been used but which ones are more effective in specific environments. This will be investigated during this research because when it comes to these complex environments it's hard to know what is right or wrong due to all the aspects that need to be considered. From my understanding of Clutterbuck scrum and extreme programming have many risks that are involved when using agile adoption (Clutterbuck, P. (2009)). But there are potential methods of managing these risks to minimize the impact of them and to also decide if the organization is ready for an agile adoption. SAMI(Sidky Agile Measurement Index) is used to help understand if your organization is based on their current situation, are ready communication wise and financial and sets agile practices that can be implemented. This is an agile measurement index which uses 4 different components, agile levels, agile principles, agile practices and concepts, and indicators. These components help with the adoption process by making improvements in different processes such as the software development process. It also provides guidelines to make sure that the development process is agile (Sidky, A., Arthur, J., & Bohner, S. (2007)).

Literature Review

This paper focuses on the agile adoption of scrum and extreme programming and the risks that can be identified and managed for small and medium enterprises using agile adoption. The research is completed through previous research and interviews and observations from project managers, project team members and customers. This can help me understand how small and medium enterprises can get affected differently when it comes to risks. I will go read about how larger enterprises identify their risks and manage them then compare and see if the size of the organization will affect the way that scrum adoption should be executed.
(Clutterbuck, P. (2009)).

He explains the barriers and challenges involved in an agile transition. He talks about human related challenges and the grounded theory. The purpose of the paper is to "describe the origins and reasons of these challenges and issues in order to help software companies and development teams". Improving the results when undertaking an agile transition using the processes that have been found through this research. This can benefit to have a greater understanding of the different types of challenges involved in an agile transition, in this case its human-related challenges and how grounded theory can help with that. I will do further research on grounded theory and how different organizations use it to fully understand how effective it is. (Gandomani, T., & Nafchi, M. (2016)).

The paper's focal point is on the key factors that make agile adoption successful and the importance of communication. The digital tools that can be used to communicate and coordinate with a team in a project and how effective they are. Having a facilitator and principal investigator is important and why. My research can benefit from understanding different solutions to challenges, in some cases communication is a key reason why organizations fail. So I can do some deep research on this then I can provide solutions revolving around communication such as facilitators and principal investigators (Hidalgo, E. (2018)).

AAIM(Agile adoption and improvement model) is what the paper explores. This has the ability to be used as a road map for people that want to use an agile approach and need a way to adapt to it "AAIM has been organized in three agile blocks, six agile stages and an embedded agility measurement model." This can provide a different solution that makes planning for organizations easier which can increase the chance of success. Researching different models that help in a similar way would be interesting and could provide another area to investigate. Looking into the technical or more planning side of agile adoption is another aspect that needs to be considered. With this one being one of the first models it will be good to look into how many there are and how they compare to each other. (Qumer, A., Henderson-Sellers, B., & McBride, T. (2007)).

This talks about Sidky Agile Measurement Index (SAMI) and how it can be used for agile adoption. It also covers the four-stage process to assist in understanding if the organization should do agile adoption based on their current situation and also what set of agile practices should be implemented. This will be helpful for understanding about a new concept called agile measurement index. The components involved are agile levels, principles, practices and concepts, indicators. I think these methods and processes I can look more in depth on and get a further understanding of as this agile measurement index is a new concept to me and from what I have read I believe this is a huge benefit for organizations looking into agile adoption. (Sidky, A., Arthur, J., & Bohner, S. (2007)).

This paper focuses on methods and processes that can overcome human related challenges. Using social intelligence when being a project manager is mentioned in this paper to work around agile. When implementing agile there can be resistance or lack of support so sometimes what is needed is not to bring agile in at its purest form but adjust it to match the environment of the organization that you are working with. Learning how to do this method can be hugely beneficial for my research as it covers human-related challenges in the adoption phase, what can come up and how to work around them. So using this information and comparing it to other methods and seeing if it works in other processes could be something to investigate. (Jignya Patel & Robin Poston (2021)).

This paper shows how scrum in New Zealand is the most used agile process and why that is the case. It makes me want to investigate the other agile processes to see what makes Scrum different from other processes and maybe why it better suits the New Zealand culture before diving into Scrum adoption. (Licorish S. A. (2016))

The goal here is to explain the challenges that come with adopting scrum. Challenges such as inexperience, lack of communication and teamwork have been identified commonly when adopting scrum. There is a model that is discussed called the Innovation theoretical model helps to find these challenges experienced on an individual level. It has 4 constructs called individual factors, tema factors, organizational factors and technology factors. These constructs have 19 different independent variables that will help with understanding which factors assist an individual either adopting or rejecting Scrum for the organization. Having a detection process would be hugely beneficial for any organization adopting scrum. I will need to look into different processes that involve the same role and possibly get a better understanding on how the process is managed and executed. (R. Hanslo and E. Mnkandla, (2018))

The rise in Agile has been due to waterfall having many issues that restrict software development. This is due to the strict scheduling that is making many software projects run over budget or failing. Agile gives these teams more flexibility with the design and the structure reducing the focus on planning and processes. It was interesting reading through this because it made me think of all the processes that are being added to agile to try and help with issues and challenges that it has, which could lead to in the future to be more structured and more like waterfall that originally anticipated. (S. A. Licorish. (2016))

This is another paper by Hanslo focusing on the challenges on Scrum adoption but with additional information on some challenges he has identified using SACDM(Scrum Adoption Challenges Detection Model). Common challenges of this are lack of experience, the organizational culture and lack of communication. Once again these papers are mentioning the lack of communication in these organizations. It must be a huge issue if all of these papers are talking about it. I will need to do some further research on why it is so hard for these organizations to manage the communication in the teams and investigate some possible solutions to this issue. (R. Hanslo, E. Mnkandla and A. Vahed (2019))

Methodology

RESEARCH PROBLEM

Due to agile becoming a mainstream method in the software industry people have been trying to optimize the processes around agile to suit their organization. Here are some of the questions to research to help with this. What are the issues and uncertainties(challenges/risks) that organizations are facing when implementing scrum adoption? What factors enable a successful adoption of scrum methods? What environments are preventing organizations from having a successful scrum adoption? What methods are currently being used for agile adoption and how effective are these methods in comparison to others? Are there potential methods or processes that could be used to enhance the agile adoption methods that are already out there?

AIM AND OBJECTIVES

The aim of research is to identify scrum method adoption impact(issues and challenges) and identify possible strategies to overcome adoption issues.

Objective
- Review literature to identify scrum method practices.
- You have to write a protocol based on the SLR(Systematic Literature Review) method.
- Identify specific literature to review based on QA(Quality Assurance) identified protocol.
- Investigate and analyze literature based on the research question.

Give a greater understanding of scrum adoption and the impacts it can have on an organization or team. This will cover both the positive and negative effects that can take place with the various methods that have been uncovered through my research and how they compare with each other. This information will be found through SLR to ensure that my research is in-depth. The analysis will then be done with coding so find common links in the research I have uncovered. The comparisons will be investigating issues and uncertainties that take place with these methods and what factors resulted in the adoption to be successful. This can be used to reflect and possibly develop a new method using parts of many other methods.

SPECIFIC RESEARCH QUESTIONS

What are some issues that come with doing an agile or scrum adoption?
What are some uncertainties that come with doing an agile or scrum adoption?
What are some factors that can lead to a successful agile or scrum adoption?
What are some adoption strategies to overcome issues in scrum adoption?

Method

RESEARCH METHODOLOGY

My research strategy will be using SLR(Systematic literature review) for my research. I can then get an understanding on what the literature has identified, evaluated and use it to improve my knowledge in the area (Okoli, C., Schabram, K. (2010)). I will be undertaking a MLR (Multivocal Literature Review) which includes grey literature into my research. This is so I can use any lecture information that I find useful and want to reference it. With the addition of grey literature it will make my research experience easier and widen the areas I can search through because there is other grey literature that isn't just lectures such as blogs and videos that I can use (V Garousi, M Felderer, M V. Mäntylä, (2019)). When using this method I will need to have an unbiased opinion so that I can get all perspectives of the decision. This will follow by reflecting on the literature and making my own judgment on the field. The data that I will collect will vary from what is scrum and different agile methods to agile adoption methods and where those methods are best for use in organizations. I want to make sure that I cover basic information about the different agile methods because I want the reader to understand some of the agile methods that they may not have known about before getting into agile adoption. This will be important for comparing what will be easier to adopt into when looking at the different agile adoption methods. One key research point will be why agile adoption is important for organizations and how agile adoption methods help with the implementation of agile methods. Then finally what are the various agile adoption methods that are out there and how do they compare with each other. Some of these websites include the aut library https://librarysearch.aut.ac.nz/ , Springer Link https://link.springer.com/ and IEEE https://ieeexplore.ieee.org/Xplore/home.jsp.

DATA GATHERING METHODS

Systematic literature review is used by breaking it down into 3 phases. The first phase is to plan and determine why an SLR is the best method to carry out the research. This is completed through a review protocol. The second phase is to run the review, this includes defining search terms and see what result comes from these terms. I will be looking at quality assurance, data synthesis and data that can be extracted from it. The final phase is summarising the results into a report. This will involve specifying dissemination mechanisms. These phases are used to reduce the effort involved when executing SLR and support the data sources that are being used in a research paper (A. Hinderks, F. José, (2020)).

DATA ANALYSIS TECHNIQUE

Coding because this will allow me to gather up themes and trends from the research and make a clear understanding on what commonly works well in agile adoption and also what commonly is an issue in agile adoption (Auerbach, C., & Silverstein, L. B. (2003)). I can then use this to try and see if there are further methods that could be used to counteract this issue that is common when working with agile adoption. Coding is used to create meaning behind the data that is being found from research. When the meaning has been found, that is where the themes can be discovered. St. Pierre, E. A., & Jackson, A. Y. (2014). Once a theme is discovered it can be analysed and interpreted, in the case of scrum adoption, there could be a method that many organizations use and by discovering this then we can try to understand why that is the case and break down the positive effects of choosing this method.

Timeline

Week 1 - 14th June	Begin expansive research on literature so that I can review the scrum method practices.
Week 2	Continue expansive research on literature
Week 3	Continue expansive research on literature
Week 4	Continue expansive research on literature
Week 5 - 12th July	Semester 2 Starts and I begin writing up a protocol on the SLR method.
Week 6	Continue protocol
Week 7	Continue protocol
Week 8	Identify specific literature to review based on QA initial protocol.
Week 9	Continue Identifying specific literature to review based on QA initial protocol.
Week 10 - 16th August	Investigate and analysis literature based on the research question
Week 11	Investigate and analysis literature based on the research question
Week 12	Investigate and analysis literature based on the research question
Week 13	Investigate and analysis literature based on the research question

Week 14	Investigate and analysis literature based on the research question
Week 15 - 20th September	Begin using all the information gathered and construct it into a research report
Week 16	Continue using all the information gathered and construct it into a research report
Week 17	Continue using all the information gathered and construct it into a research report
Week 18	Continue using all the information gathered and construct it into a research report
Week 19	Make constant adjustments to the research report to improve it until the due date.
Week 20 - 5th November	The research is required to be completed by this date.

RESEARCH ETHICS

I will not need to do an ethics approval process as I will be using sources online that are public. Referencing journal articles and books that are used in my research.

CONTEXT OF THE RESEARCH

I will be researching the agile adoption methodologies that I use in the current organizations and see what issues and uncertainties they have in those methods and what enables the methods to be successful. I think this is important because of the context behind what methods are used, which can lead to potential refinement of the method or maybe a new method altogether using the already successful aspects of previous methods. Scrum being one of the most used agile methods in New Zealand it will be important to focus primarily on scrum adoption when researching agile adoption (Licorish S. A., 2016). When looking into Scrum adoption I will be investigating how both socially and physically the organizations are affected by it both negatively and positively when correctly or incorrectly executed. This will lead to an understanding of what challenges frequently occur and how to work around them and what methods and processes work well and should be followed in most cases.

Research Design

Search Strategy

The primary aim of this is to define the strategies behind the searches and evaluations for the main studies. The strategies are to help search through a large amount of white and grey literature that answer the research question.

Identify Search Terms

PICO (Population, Interest, Comparison and Outcomes) is the framework I am going to use to identify my search terms (Schardt, C, 2007). This will give my search terms some structure to follow when researching.

Population: Organizations that have been or have tried to work in a Scrum environment.

Interest: Scrum Adoption

Comparison: Positive and Negative effects of the Scrum adoption process.

Outcome: Understanding of scrum adoption and the impacts it can have on an organization or team.

Major terms: Scrum Adoption, Scrum Processes, Scrum Benefits

The search strings will be made up into three substrings: S1, S2, S3

S1 is the string which consists of keywords related to Scrum Adoption such as "Adopt Scrum", "Adopting Scrum", "Adoption of Scrum", "Changes in Scrum"

S2 is the string which consists of keywords related to Scrum Processes such as "Scrum Methodology", "Agile Processes", "Agile Methodology"

S3 is the string which consists of keywords related to Scrum Benefits such as "Scrum uncertainties", "Scrum challenges", "Scrum Issues"

("Scrum Adoption" OR "Adopt Scrum" OR "Adopting Scrum" OR "Change to Scrum") AND ("Changes" OR "Challenges" OR "Issues" OR "Uncertainties" OR "Benefits")

Resources to be search for WL

When searching I will be focusing on digital libraries to get my literature. I will also be using snowballing (Kitchenham, 2007).

Digital Library

The main reason I am using digital libraries is because the sources available have a large range to search through and there are many digital libraries as well that can be used. These libraries are easy to use and search through to find literature that is relevant to my research.

- IEEExplore
- ScienceDirect
- Springer Link
- AUT Library

Snowballing

This can be useful for both reference and citation tracking when looking at specific papers.

Resources to be search for Grey Literature

There are two strategies that I will be using for Grey Literature. First one is a general website and the other is specific databases and websites (Vahid Garousi, 2019).

General websites are going to be focused on using google to undertake basic searches that could lead to possible sources of information I could look into more.

Specific databases and websites will be focused more on the websites that I can source back to. In this case the main website will be scrum.org as this is a website made by the owners and creators of scrum. If there is any confusion on how scrum works this so clarify any of that for me.

Study Inclusion and exclusion criteria

The inclusion and exclusion criteria is used to identify the requirements that the source needs to provide so that it can be added to the study. Suggestions from (Vahid Garousi, 2019) assisted in defining this criteria.

Inclusion Criteria	The study must be relevant to the search terms defined
	The study must be written in English
	The study must be published between 2001 to 2021
	Academic paper that has been peer reviewed that has involvement with Scrum or agile but more so with the topic of adoption in mind.

Exclusion Criteria	The study does not display relevance based on the search terms defined. The study has not been written in English. The study can not be accessed through full-text. The study is a short paper such as a PowerPoint presentation, poster or panel discussion. The study is a duplicate where the information has already been obtained from a separate source.

Study Selection Process

The separation process of the white and grey literature is assisted by (Vahid Garousi, 2019)

Study selection process for White Literature

1. All the digital databases will have the search string created before inserted.
2. The studies are then scanned through the inclusion and exclusion criteria and the irrelevant ones are removed. If there is a study that is not sure then consult with another researcher to make a more accurate decision.
3. Snowballing is applied to the studies that have come from the search results. This is continued to collect more relevant studies.
4. The main studies are combined and the duplicates are removed.

Study selection process for GL

1. All the digital databases will have the search string created before inserted.
2. The studies are then scanned through the inclusion and exclusion criteria and the irrelevant ones are removed. If there is a study that is not sure then consult with another researcher to make a more accurate decision.
3. The main studies are combined and the duplicates are removed.

Combining final WL studies and GL studies

After this the grey and white literatures from the results are combined

Study quality assessment criteria

This is used to identify the quality of the literature retrieved from the Study selection process. They are rated to see how the quality of the study is.

Criteria	Questions
1. Authority of the publisher (Measure= 0 or 1)	● Is the publishing organization reputable/ Author is associated with reputable organization? ● Is the organization/ author cited often by others? ● Has the author published other work in the field?
2. Source context (Measure= 0 or 1)	● Does the source have a clearly stated aim/objective? ● Is the focus of study on RE in a large scale globally distributed agile setting? ● Are any limits clearly stated? ● Is the source supported by documented references? ● Are the conclusions justified by the result?
3. Publication Date (Measure= 0 or 1)	● Does the source have a clearly stated date?
4. Significance of work (Measure= 0 or 1)	● Does the source enrich the current research, and/or particularly add something unique?
5. Publication/literature type (Measure= 0 to 4)	● Academic peer reviewed: Extremely high credibility (Measure=4) ● PhD. /Master thesis: Very high credibility (Measure= 3)

	● Peer reviewed experience reports: High credibility (Measure=2) ● Established vendor/leader (method creator) – case studies, blogs: Moderate credibility (Measure=1) ● Commentary/opinion, blog posts from non-established vendor: Low credibility (Measure=0)

Sourced from: (Vahid Garousi, 2019)

Data extraction process

This is the information that I will provide for the studies that are involved in my research. The following information will be.

Information of publication: Paper ID,

Authors,

Year of Publication,

Title,

Venue (where the source was published),

Quality score.

Context descriptions: Study Type

Settings (country/location of the analysis).

Findings: Relevance to the theme

Data synthesis

This is used to find key information that is a common theme that is identified in the studies. This is complete by synthesizing the data with the following steps
Extract data
Code data
Translate codes into themes
Reviewing themes

Validation of review process

This process can be validated by receiving feedback on the protocol produced. This first draft will be reviewed by supervisor Ramesh Lal and will provide feedback on it.

Data extraction and synthesis will need another researcher or supervisors at the AUT facility that are willing to support my research, to check over the data collected to see if the data extracted was valid and also if they were used correctly to make the themes.

Changes will be made and known there the versions numbers that will be used. So when there is a change made it will result in the version number changing.

Reporting the review

It is planned to publish the process and the results of the MLR on the scrum method adoption impact(issues and challenges) and identify possible strategies to overcome adoption issues. This report will be supported by the articles and journals explored with evidence provided of the process and the final report.

Search Results

From my searches I have obtained 207 from AUT Library, 13 from IEEExplore, 118 from SpringerLink and 82 from ScienceDirect.
This totals to 420 sources.

Many of the sources were repeats between AUT Library and the other website so this list dropped to 279

The sources that had nothing to do with the research questions and/or were not in English were filtered out.
This list dropped it to 173 sources.

I filter the list down based on my study quality criteria got 51 well supported studies based on this criteria

Findings

There were 51 studies that I researched to understand both the issues and uncertainties alongside the success factors and strategies. From the 51 studies 34 were about issues and uncertainties, 35 were about success factors and 17 were about strategies to engage those success factors. This shows that most studies discuss issues, uncertainties and success factors while strategies are the least. This will be due to the high level experience and understanding required to be able to develop these. The list of what paper discussed each area is in the Appendix under Appendix A.

From the issues and uncertainties that we categorized as they have plenty of commonalities, the most common was poor communication closely behind was over-commitment from external pressure and lack of knowledge/skills. This means most studies believe that these are the main areas to focus on.

The success factors and strategies had both high and low numbered tallies in areas. The highest being requirement management, flexibility and transparency. These being the top means that most studies want organizations to start using these strategies and help improve the adoption of agile in the workspace.

All these tallies for issues, uncertainties, success factors and strategies were added if the author had mentioned it based on the research questions discussed before. Below are all the areas that were discovered with explanations on how they were defined and managed. More detail tallies are available under Appendix under Appendix B for issues and uncertainties and Appendix C for success factors and strategies.

Issues/Uncertainties	Tally
Change Resistance	9
Over-commitment from external pressure	17
Managing Environments	7
Lack of organizational culture	13
Quality assurance	12
Difficulty incorporating Non development tasks	11
Maintaining motivation	13
Undefined objective	7
Poor communication	19
Insufficient documentation	12
Sprint Management	14
Inconsistant agile implementation	10
Lack of knowledge/skills	17
Poor Management support	16
Customer collaboration	12

Under Appendix, Appendix B

Success factors	Strategies	Tally
Management	Requirements management	26
	Top management support	14
Adaption	Flexibility	25
Structured Plan	Choosing and customizing agile method	14
	Deploy Appropriate tools	10
Knowledge	Training and coaching	15
Communication	Transparency	25
	Mindset and Alignment	22

Under Appendix, Appendix C

Issues/Uncertainties

Change Resistance - This takes place when the management or the employees resist the change of agile due to their beliefs (Khoza, 2021). These beliefs could range from thinking that agile will not work for this organization or even afraid to lose a job due to the change of structure.

Over-commitment from external pressure - When the customer is requesting additional features while the current features have not been completed. The stress will result in over budgeting and lower quality products (Rory V. O'Connor, 2014).

Managing Environments - Managing multiple teams within an organization so that their coordination can result in conflict of interest due to the different approaches the teams have. This can impact the environment negatively making the employees less motivated to perform when working (Artem Marchenko, 2008).

Lack of organizational culture - When the team is not in sync due to lack of culture it can be hard for these teams to make decisions as everyone has different views and ideology that conflict each other. This means when changes need to be made to address an issue it will in most cases be ignored or shut out by someone who does not think it is an issue from their perspective (Ridewaan Hanslo, 2018).

Quality assurance - With a lack of quality assurance will lead to a product that the customer is not satisfied with. This is why ensuring that the quality is at a high standard is important (Janeth Lopez-Martinez, 2016). This can be hard to ensure without a team that is supportive and other outside sources will affect the quality such as motivation.

Difficulty incorporating non development tasks - This involves tasks such as documentation, requests, reports that are important for ensuring that the product is being tracked and managed. These documents can help to find risks or manage issues that have come up. The issue come when trying to maintain that these documents and documentation are being produced at a frequent basis (Ismael Edrein Espinosa-Curiel, 2018).

Maintaining motivation - Ensuring that the team is motivated is important to keep the performance of the team high. This can be difficult as conflict or issues can come up that affect a team's motivation to work at a high level and will need to be addressed to maintain the motivation they once had (Artem Marchenko, 2008).

Undefined Objective - Having no objective to follow results in a team that is lost on what is required of them. This team will then develop a product that they think is required and most of the time will be incorrect and the customer will not be satisfied with the project. With adoption if you do not have a goal set for each step then the steps will not end up completed and the organization will be stuck in the middle of adoption and fail to change and everyone will go back to their old methods (Claudia de O. Melo, 2013).

Poor Communication - Communication is one of the most important tools when working in agile adoption as it can be used to be clear and ensure understanding in a team. With a lack of it this can lose that understanding and clarity and result in confusion and lack of motivation (Peter Green, 2012).

Insufficient documentation - With a lack of documentation it becomes difficult to pinpoint sources of issues or even find evidence to present and request for change to address that issue. If backtracking is required because a system is not working after an update and there is no documentation on what was changed before that update then there is no way to know what caused that issue (Abdul Rauf, 2015). This is similar when working on agile adoption, when an issue takes place during one of the adoption phases and there is a lack of documentation then how is the organization meant to investigate what went wrong and reflect to make changes for the next step to prevent this from reoccurring.

Sprint Management - Without someone managing the sprints it can create a lack of structure within the a team so when steps are made to adapt to agile the team will be confused on what to do because there will not be a structure for them to follow (Rita Marques, 2021).

Inconsistent agile implementation - When a team is unclear on a goal they tend to go back to the way they worked before. This is where overlap of agile with the methodology they used before can take place. If this happens the structure and documentation of projects can be incredibly hard to understand because they do not match. This will create confusion when making steps towards agile adoption because the steps will not match what has been done in the previous steps made (Janeth Lopez-Martinez, 2016).

Lack of knowledge/skills - Without the knowledge or skills required to accomplish a task an employee will be confused and will end up using up more time trying to figure out what is expected. This time can cost organizations quite a bit of development time and put stress on the project deadline (Rajeev Kumar Gupta, 2016).

Poor Management support - Management support is the key to keeping employees happy and motivated with working. This can be through methods that can help employees adapt to environments they are not comfortable with. Lack of this will result in employees lacking motivation to work and reduce the quality of the product (Peter Green, 2012).

Customer Collaboration - The most important people involved as they are the people that are paying you for the product that is being developed. So when issues around them take place it can be hard to please them while maintaining structure in an organization. So when an agile adoption process is taking place and you need to explain to the customer that the product could be impacted by this, usually delay from the original deadline this can cause tension with the customer (Georgia M. Kapitsaki, 2015).

Success factors/Strategies

Management
- **Requirements Management** - Requirements are important for understanding what is expected by the customer. With managing this it needs investment in time to refine this requirements so that it is clear to both the customer and the team what will be the final product (Jil Ann-Christin Klunder, 2019). Methods of performing this can be through user stories as it presents to the team an understanding of a user what is needed to be produced for a feature. In the case of agile adoption it is to ensure what is required for the adoption to be successful from the start so spending the time to make sure it is clear to everyone what is going to take place will provide people in the organization comfort knowing what is going to happen.

- **Top Management Support** - The managers are expected to provide full support the the organization during an adoption. The key aspect is to motivate employees throughout the adoption phase to ensure that there is a clear understanding. Presenting methods on how the new organization will be working ensures security to employees and allows them to adapt to this new way of working through coaching them on agile (Alemeida Fernando, 2019).

Adaption
- **Flexibility** - This can be used as a tool for reducing stress to the teams in cases where deadlines may lead to a team reducing the quality to match it. When adapting to agile presenting the option to people to change reduces stress to them and in the long run ends in a higher quality product. Providing more options to a team on what they can do and less restriction from the organization lets the team present new ideas that could enhance a product or even the structure of the organization to work more effectively. After all, getting everyone involved in the adoption process is key to having an organization where employees are satisfied (Jil Ann-Christin Klunder, 2019).

Structured Plan
- **Choosing and Customizing Agile Method** - When choosing an agile method it is important that it is customised to match the organization and the employees needs as they will be the people using it. If the employees are involved in this process it will bring them comfort and security to know they have the ability to speak up if they see an issue that could be addressed and be adjusted to improve the organization as a whole (Didier Casanova, 2019). These methods can be changed at any time to adjust the employees and the processes involved to ensure that the organization is performing to the best of its ability.

- **Deploy Appropriate Tools** - Deploying tools that match the structure of the organization is important to maintain stability with employees. If tools presented for agile adoption do not match what tools they used before it can cause confusion and tension with teams and can cost a lot of money to coach on the use of them (Panuchart Bunyakiati, 2016). So ensuring the tools still stick to what employees are familiar with while still adapting to agile is crucial to keep employees satisfied with the steps coming from agile.

Knowledge
- **Training and Coaching** - Employees that are new to an organization require training and coaching on how it is run. This is why when agile adoption takes place in an organization training and coaching is required. Presenting a new way of running the organization will need employees to learn how the processes and methods work and in most cases learn what agile is and how it can be used effectively (Minna Pikkarainen, 2011). This will provide employees with confidence when working on a project because of the new knowledge they have provided and how they can use it to enhance future project work.

Communication
- **Transparency** - This is important when making any changes to an organization so that any employees that are impacted by it are aware beforehand and make changes if need be to adjust to the change. This is no different with agile adoption as this change will impact almost all members of the organization in methodology or process. Being transparent with everyone means there will prevent confusion when steps are made towards an agile organization. When members understand the change they are less likely to resist the change so the process of adoption will become easier (Martin Kalenda, 2018).

- **Mindset and Alignment** - Ensuring that all members of an organization have the same mindset and alignment can make planning easier, as presenting perspectives will be clearer and more agreeable. With members being more understandable to a perspective it can be easier to make an agile adoption and show what benefits can come from it. This can be accomplished through values and social events (Tuomas Ihme, 2013). When aligning values that match the employee and the organization it can help the employee bond with them and make working for them more enjoyable and productive. Having events where people can socialize and create a stronger bond between different members of the organization to create a friendly environment at work. This can create confidence in the work space and overall better and easier to present an agile adoption to them as a bond has already been created (Ridewaan Hanslo, 2019).

Discussion

The findings that were uncovered were interesting as it revealed that the most discussed issues and certainties all involve human contact, this being poor communication, over-commitment from external pressure and poor management support. This will be because ensuring that everyone working on a project has the same ideology on what is expected and that it matches the customer can prove incredibly difficult because of the lines of communication involved. It starts with the customer introducing the idea with the organization, after that a project manager will get involved. Then the project manager will present the idea to the team that has been assigned to work on it. Then the team needs to discuss amongst each other on how this can be executed. With all these lines of communication the idea can be morphed due to how the person interpreted what the customer had originally presented it or even what he originally thought he wanted as his ideology on the project can change as well. This is why transparency on the project at all times is so important to ensure that everyone has the same mindset on the project so that the final product is exactly what the customer wants. When you have all of this going on and then the organization decides to change how it runs with a agile adoption it can change how the project is managed resulting in changes to the product without any intention this is why being transparent with the progress that is made with a customer can ensure that what the team is doing matches his vision.

This is the same for the adoption, the organization needs to include everyone that will be affected by the adoption so they can understand the processes that will be involved in adopting to be agile and the steps that the organization will take towards being agile. Without the clear communication it can create unease within part of the organization and the teams as they may be negatively affect by the adoption but if there is a strong management support that can ensure this can be supportive when things get hard, this helps to motivate team members to continue to produce a high quality product during the adoption process.

Also ensuring that external pressure does not negatively affect the project, this is common for time pressure to affect the quality of the final product. This is because a customer will present a time that they want to release the product and the longer it is not available will lose them money so that will affect the developers to take shortcuts to ensure the completion that was presented by the customer as the cost of the quality of the product. This is where being transparent once again can be effective to ensure the customer understands the current situation so they can make a decision if they want quality or completion earlier. This is the same with agile adoption. When you rush the adoption process too fast it can negatively affect the organization resulting in a failure of adoption. It is key to make sure the steps and process are completed for the adoption to be successful but time and cost pressure just reduce the chance of success.

The management support of the organization can keep a team focused and on task during a project this can prove to be difficult for the support managers as they need to build a bond through events to learn about the team members before they can effectively support them. This can take time and when time pressures are involved this can negatively affect the bonding process and create conflict in some cases. But when that bond has been developed it is a huge

benefit to the employees when changes from adoption take place because providing them support can ensure that they will remain supportive of the organization and productive through the steps and process of agile adoption.

One that has some communication involved but is more of a financial investment to the organization is lack of knowledge/skills. This happens because of budget and time restrictions around coaching employees on agile. Coaching can cost an organization a lot of time and costs to perform and there is always the risk of the employee leaving so the investment in some cases may not be worth it. But when doing an agile adoption it is required that everyone has the same mindset and goal but the end of the adoption process. This cannot take place if some employees do not have the knowledge or skills on how agile works or is run, or even how the organization wants to run their agile processes. This will result in confusion amongst members of the organization resulting in a slower process and even lower quality products because their expertise in the area is not to a high level yet and will take time for them to learn it on their own if they are not provided coaching. The benefits of providing this coaching can result in more flexibility with the steps and processes around the agile adoption and more feedback from employees on where the strengths and weaknesses of the current processes are so that the adoption can be the best it can possibly be.

Conclusion

As you can see there one a strategy that can be implemented to an issue or uncertainty but the problem comes when trying to execute it successfully. But this shows that Scrum is not the silver bullet to having an effective organization because even in 20 years time when Scrum was first discovered the same issues are still coming up. But when used effectively and implemented strategies properly without shortcuts can be a great way of addressing these issues and uncertainties and as seen before having an organization that is willing to change and adapt is the key to having a successful agile adoption and ensuring that any issues and uncertainties that come up are address as soon as possible before that affect the process. This gives an idea on what organizations are experiencing currently based on our peoples research around the world. It would be interesting to see what the results would be to interview organizations in New Zealand and compare to see if New Zealand has the same issues and uncertainties or if there are new ones that they experience that have not been discussed yet.

References

Clutterbuck, P. (2009). *A Risk Management Investigation of SME Adoption of Agile Method Information System Development*. https://content.ebscohost.com/ContentServer.asp?EbscoContent=dGJyMNHX8kSeqLI4v%2BbwOLCmsEmepq9Sr6%2B4Ta6WxWXS&ContentCustomer=dGJyMPGotVG3q7ZJuePfgeyx9Yvf5ucA&T=P&P=AN&S=R&D=bth&K=48916757

Gandomani, T., & Nafchi, M. (2016). Agile transition and adoption human-related challenges and issues: A Grounded Theory approach. In *Computers in Human Behavior* (Vol. 62, pp. 257-266). Science Direct. https://www.sciencedirect.com/science/article/pii/S0747563216302746

Hidalgo, E. (2018). Management of a Multidisciplinary Research Project: A Case Study on Adopting Agile Methods. *Provocative Idea*, *14*(1), 15. https://files.eric.ed.gov/fulltext/EJ1185869.pdf

Qumer, A., Henderson-Sellers, B., & McBride, T. (2007). *Agile adoption and improvement model*. http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=408A998A4B6F2EEB3FC9653B20856543?doi=10.1.1.95.7417&rep=rep1&type=pdf

Sidky, A., Arthur, J., & Bohner, S. (2007). A disciplined approach to adopting agile practices: the agile adoption framework. *innovactions System Software Engineering*, *3*(1), 203-216. https://link.springer.com/content/pdf/10.1007/s11334-007-0026-z.pdf

Okoli, C., Schabram, K. (2010). "A Guide to Conducting a Systematic Literature Review of Information Systems Research," . Sprouts: Working Papers on Information Systems, 10(26). http://sprouts.aisnet.org/10-26

Auerbach, C., & Silverstein, L. B. (2003). Qualitative data: An introduction to coding and analysis (Vol. 21). NYU press. https://books.google.co.nz/books?hl=en&lr=&id=zclS-vzxsycC&oi=fnd&pg=PP7&dq=data+analysis+coding&ots=GrCoMNM2Ah&sig=pSqxomBkY8K9lmI7NbI6brDoYWc#v=onepage&q=data%20analysis%20coding&f=false

S. A. Licorish et al. 2016, "Adoption and Suitability of Software Development Methods and Practices," 23rd Asia-Pacific Software Engineering Conference (APSEC), 2016, pp. 369-372, https://ieeexplore.ieee.org/abstract/document/7890614?casa_token=QrHYsAy2qL0AAAAA:0VJEI8Vxr0_MfKjMZnaFxINajnhQs6SUXtcSHyTi40KG5mJkMSRac5WZyOBcPqqGEe5kjFtju80

Jignya Patel & Robin Poston (2021) Using Social Intelligence to Overcome Agile Adoption Challenges, Journal of Computer Information Systems, https://www.tandfonline.com/doi/full/10.1080/08874417.2021.1913670

A. Hinderks, F. José, D. Mayo, J. Thomaschewski and M. J. Escalona,, (2020) "An SLR-Tool: Search Process in Practice : A tool to conduct and manage Systematic Literature Review (SLR)," pp. 81-84.https://ieeexplore.ieee.org/document/9270294

St. Pierre, E. A., & Jackson, A. Y. (2014). Qualitative data analysis after coding. https://www.researchgate.net/profile/Alecia-Jackson-2/publication/270481796_Qualitative_Data_Analysis

_After_Coding/links/56ae4c3308ae28588c61bae8/Qualitative-Data-Analysis-After-Coding.pdf

F. Maurer and G. Melnik, 2006 "Agile methods: moving towards the mainstream of the software industry," pp. 1057-1058. https://www.computer.org/csdl/proceedings-article/icse/2006/283201057/12OmNCdk2Sa

R. Hanslo and E. Mnkandla, 2018 "Scrum Adoption Challenges Detection Model: SACDM,", pp. 949-957. https://ieeexplore.ieee.org/document/8511227

R. Hanslo, E. Mnkandla and A. Vahed, 2019 "Factors that contribute significantly to Scrum adoption," pp. 813-821 https://ieeexplore.ieee.org/document/8859982

V Garousi, M Felderer, M V. Mäntylä, 2019 "Guidelines for including grey literature and conducting multivocal literature reviews in software engineering" pp101-121 https://www.sciencedirect.com/science/article/pii/S0950584918301939

Lucas Khoza, 2021. Challenges and Success Factors of Scaled Agile Adoption - A South African Perspective. https://librarysearch.aut.ac.nz/vufind/EdsRecord/bth,151599494

Rita Marques, 2021. A gamification solution for improving Scrum adoption https://link-springer-com.ezproxy.aut.ac.nz/article/10.1007%2Fs10664-020-09816-9

Ridewaan Hanslo, 2018. Scrum Adoption Challenges Detection Model: SACDM https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/8511227?arnumber=8511227

Ridewaan Hanslo, 2019. Factors that contribute significantly to Scrum adoption https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/8859982?arnumber=8859982

Peter Green, 2012. Adobe Premiere Pro Scrum Adoption: How an Agile Approach Enabled Success in a Hyper-competitive Landscape https://ieeexplore.ieee.org/abstract/document/6298109

Martin Kalenda, 2018. Scaling agile in large organizations: Practices, challenges, and success factors https://onlinelibrary-wiley-com.ezproxy.aut.ac.nz/doi/full/10.1002/smr.1954

Georgia M. Kapitsaki, 2015. Learning from the Current Status of Agile Adoption https://link-springer-com.ezproxy.aut.ac.nz/chapter/10.1007/978-3-319-27218-4_2

Jil Ann-Christin Klunder, 2019. Transformation towards agile software product line engineering in large companies: A literature review https://onlinelibrary-wiley-com.ezproxy.aut.ac.nz/doi/full/10.1002/smr.2168

Claudia de O. Melo, 2013. The evolution of agile software development in Brazil https://link-springer-com.ezproxy.aut.ac.nz/content/pdf/10.1007%2Fs13173-013-0114-x.pdf

Artem Marchenko, 2008. Scrum in a Multiproject Environment: An Ethnographically-Inspired Case Study on the Adoption Challenges https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/4599449?arnumber=4599449

Rory V. O'Connor, 2014. Assessing the Value of an Agile Coach in Agile Method Adoption
https://link-springer-com.ezproxy.aut.ac.nz/content/pdf/10.1007%2F978-3-662-43896-1_12.pdf

Alemeida Fernando, 2019. Moving from Waterfall to Agile: Perspectives from IT Portuguese Companies
https://www-igi-global-com.ezproxy.aut.ac.nz/gateway/article/full-text-html/216858

Saeedi Kawther, 2021. Software Development Methodologies, HEIs, and the Digital Economy
https://eric.ed.gov/?id=EJ1288479

Ismael Edrein Espinosa-Curiel, 2018. Analysis of the changes in communication and social interactions during the transformation of a traditional team into an agile team
https://onlinelibrary-wiley-com.ezproxy.aut.ac.nz/doi/full/10.1002/smr.1946

Janeth Lopez-Martinez, 2016. Problems in the Adoption of Agile-Scrum Methodologies: A Systematic Literature Review
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/stamp/stamp.jsp?tp=&arnumber=7477924

Abdul Rauf, 2015. Gap Analysis between State of Practice & State of Art Practices in Agile Software Development
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/stamp/stamp.jsp?tp=&arnumber=7284606

Rajeev Kumar Gupta, 2016. Challenges in Adapting Agile Testing in a Legacy Product
 https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/7577426?arnumber=7577426

Christoph Matthies, 2016. How Surveys, Tutors and Software Help to Assess Scrum Adoption in a Classroom Software Engineering Project
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/7883315?arnumber=7883315

Peter Clutterbuck, 2009. A Risk Management Investigation of SME Adoption of Agile Method Information System Development
https://librarysearch.aut.ac.nz/vufind/EdsRecord/bth,48916757

Wantana Singhto, 2016. An experience in blending the traditional and Agile methodologies to assist in a small software development project
https://ieeexplore.ieee.org/abstract/document/7748914?casa_token=Pny3PLZsd7UAAAAA:85m98n1gRikfsmo9xAkF9QrhR1FowyHQ5S9VWUOK27gHf75QiDjJNa9LKAdj48zkKG2BAj6Nw_1A

Rajeev Kumar Gupta, 2015. Challenges in Adapting Scrum in Legacy Global Configurator Project
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/7224480

Martin McHugh, 2014. An Agile Implementation within a Medical Device Software Organisation
https://link-springer-com.ezproxy.aut.ac.nz/content/pdf/10.1007%2F978-3-319-13036-1_17.pdf

Sriram Rajagopalan, 2016. Choice of Agile Methodologies in Software Development: A Vendor Perspective
https://librarysearch.aut.ac.nz/vufind/EdsRecord/bth,122400157

Noshiba Nazir, 2016. A survey on agile practices in the Indian IT industry

https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/7508196

Panuchart Bunyakiati, 2016. Fit between Agile practices and organizational cultures
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/7748915

El-Mohanned Ahmed, 2009. 25 percent Ahead of Schedule and just at "Step 2" of the SAMI
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/5261090?arnumber=5261090

Minna Pikkarainen, 2011. Strengths and barriers behind the successful agile deployment—insights from the three software intensive companies in Finland
https://link-springer-com.ezproxy.aut.ac.nz/article/10.1007%2Fs10664-011-9185-5

Ramon Noordeloos, 2012. From RUP to Scrum in Global Software Development: A Case Study
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/6337395

Yogeshwar Shastri, 2021. Spearheading agile: the role of the scrum master in agile projects
https://link-springer-com.ezproxy.aut.ac.nz/article/10.1007%2Fs10664-020-09899-4

Esra Cetin, 2018. Blended Scrum model for software development organizations
https://onlinelibrary-wiley-com.ezproxy.aut.ac.nz/doi/full/10.1002/smr.2147

Michael Dulock, 2015. Digital Collections Are a Sprint, Not a Marathon: Adapting Scrum Project Management Techniques to Library Digital Initiatives
https://librarysearch.aut.ac.nz/vufind/EdsRecord/edsdoj.edsdoj.8232edce04e248fa9ad45fa4e9b89797

Tuomas Ihme, 2013. Scrum adoption and architectural extensions in developing new service applications of large financial IT systems
https://journal-bcs.springeropen.com/articles/10.1007/s13173-012-0096-0

David G. Ullman, 2019. SCRUM for Hardware and Systems Development
https://librarysearch.aut.ac.nz/vufind/EdsRecord/bth,137120222

Didier Casanova, 2019. Agile in enterprise resource planning: A myth no more.
https://librarysearch.aut.ac.nz/vufind/EdsRecord/bth,138396048

Rita Marques, 2017. Gamifying software development scrum projects
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/8056584?arnumber=8056584

Marlon Luz, 2007. Challenges on Adopting Scrum for Distributed Teams in Home Office Environments
https://publications.waset.org/4925/challenges-on-adopting-scrum-for-distributed-teams-in-home-office-environments
References
Schardt, C., Adams, M.B., Owens, T. *et al. 2007* Utilization of the PICO framework to improve searching PubMed for clinical questions. *BMC Med Inform Decis Mak* 7,. https://doi.org/10.1186/1472-6947-7-16

Darrell K. Rigby, Jeff Sutherland, and Hirotaka Takeuchi. April 20, 2016 The Secret History of Agile Innovation. Sourced from:
http://media.loft.io.s3.amazonaws.com/attachments/The_Secret_History_of_Agile_Innovation.pdf

B, Kitchenham, 2007 Guidelines for performing Systematic Literature Reviews in Software Engineering, sourced from: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.117.471&rep=rep1&type=pdf

Vahid Garousi, Michael Felderer, Mika V. Mäntylä, 2019. Guidelines for including grey literature and conducting multivocal literature reviews in software engineering, sourced from
https://www.sciencedirect.com/science/article/pii/S0950584918301939

F. Maurer and G. Melnik, 2006 "Agile methods: moving towards the mainstream of the   software industry," pp. 1057-1058.

S. A. Licorish et al. 2016, "Adoption and Suitability of Software Development Methods and Practices," pp. 369-372, https://ieeexplore.ieee.org/document/7890614

Okoli, C., Schabram, K. (2010). "A Guide to Conducting a Systematic Literature Review of Information Systems Research," . Sprouts: Working Papers on Information Systems, 10(26).
http://sprouts.aisnet.org/10-26

V Garousi, M Felderer, M V. Mäntylä, 2019 "Guidelines for including grey literature and conducting multivocal literature reviews in software engineering" pp101-121
https://www.sciencedirect.com/science/article/pii/S0950584918301939

John Weeks, 2017. Introduction to the Special Issue: The Day-to-Day Lives of Cultures and Communities
https://journals-sagepub-com.ezproxy.aut.ac.nz/doi/pdf/10.1177/0170840617709311

Ayesha Khalid, 2020. Agile Scrum Issues at LargeScale Distributed Projects: Scrum Project Development At Large
https://www-igi-global-com.ezproxy.aut.ac.nz/gateway/article/full-text-pdf/248532

E.L.C Law, 2015. Whose Experience Do We Care About? Analysis of the Fitness of Scrum and Kanban to User Experience
https://librarysearch.aut.ac.nz/vufind/EdsRecord/edselc,edselc.2-52.0-84940472836

Stephen Denning, 2013. Why Agile can be a game changer for managing continuous innovation in many industries
https://www-emerald-com.ezproxy.aut.ac.nz/insight/content/doi/10.1108/10878571311318187/full/html

Rashina Hoda, 2013. Self-Organizing Roles on Agile Software Development Teams
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/6197202

Rafael Tome de Souza, 2015. Evaluating capstone project through flexible and collaborative use of Scrum framework
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/7344249

Tugba Karabiyik, 2020. Understanding the Interactions between the Scrum Master and the Development Team: A Game-Theoretic Approach

https://librarysearch.aut.ac.nz/vufind/EdsRecord/edswsc,000580707500001

Neda Kaleshovska, 2015. THE CONTRIBUTION OF SCRUM IN MANAGING SUCCESSFUL SOFTWARE DEVELOPMENT PROJECTS
https://librarysearch.aut.ac.nz/vufind/EdsRecord/bth,108488425

Stephen Denning, 2013. Why Agile can be a game changer for managing continuous innovation in many industries
https://www-emerald-com.ezproxy.aut.ac.nz/insight/content/doi/10.1108/10878571311318187/full/pdf?title=why-agile-can-be-a-game-changer-for-managing-continuous-innovation-in-many-industries

Sergey Prokhorenko, 2012. Skiing and Boxing: Coaching Product and Enterprise Teams
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/6298112

B. Schatz, 2005. Primavera gets agile: a successful transition to agile development
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/1438326

Georgios Theocharis, 2016. Is *Water-Scrum-Fall* Reality? On the Use of Agile and Traditional Development Practices
https://link-springer-com.ezproxy.aut.ac.nz/chapter/10.1007/978-3-319-26844-6_11

Eduardo Valentin, 2015. Rapid improvement of students' soft-skills based on an agile-process approach
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/7344408

Ana Sofia, 2008. Blending Scrum practices and CMMI project management process areas
https://link-springer-com.ezproxy.aut.ac.nz/content/pdf/10.1007/s11334-007-0040-1.pdf

Ghada Alaa, 2014. A multi-faceted roadmap of requirements traceability types adoption in SCRUM: An empirical study
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/7036675

Scott Downey, 2013. Scrum Metrics for Hyperproductive Teams: How They Fly like Fighter Aircraft
https://ieeexplore-ieee-org.ezproxy.aut.ac.nz/document/6480431

Appendix

Appendix A:

Sources/Research Questions	What are some issues that come with doing an agile or scrum adoption?	What are some uncertainties that come with doing an agile or scrum adoption?	What are some factors that can lead to a successful agile or scrum adoption?	What are some adoption strategies to overcome issues in scrum adoption?
Challenges and Success Factors of Scaled Agile Adoption - A South African Perspective	✔	✔	✔	✔
A gamification solution for improving Scrum adoption	✔	✔	✔	✔
Scrum Adoption Challenges Detection Model: SACDM	✔	✔		
Factors that contribute significantly to Scrum adoption	✔	✔		
Adobe Premiere Pro Scrum Adoption: How an Agile Approach Enabled Success in a Hyper-competitive Landscape			✔	
Scaling agile in large organizations: Practices, challenges, and success factors	✔	✔	✔	✔
Learning from the Current Status of Agile Adoption	✔	✔		
Transformation towards agile software product line engineering in large companies: A literature review			✔	
The evolution of agile software development in Brazil	✔	✔	✔	
Scrum in a Multiproject Environment: An Ethnographically-Inspired Case Study on the Adoption Challenges	✔	✔		
Assessing the Value of an Agile Coach in Agile Method Adoption	✔	✔		
Moving from Waterfall to Agile: Perspectives from IT Portuguese Companies	✔	✔	✔	✔

Software Development Methodologies, HEIs, and the Digital Economy	✔	✔		
Analysis of the changes in communication and social interactions during the transformation of a traditional team into an agile team	✔	✔	✔	✔
Problems in the Adoption of Agile-Scrum Methodologies: A Systematic Literature Review	✔	✔		
Gap Analysis between State of Practice & State of Art Practices in Agile Software Development	✔	✔		
Challenges in Adapting Agile Testing in a Legacy Product	✔	✔		✔
How Surveys, Tutors and Software Help to Assess Scrum Adoption in a Classroom Software Engineering Project	✔	✔		
A Risk Management Investigation of SME Adoption of Agile Method Information System Development	✔	✔	✔	
An experience in blending the traditional and Agile methodologies to assist in a small software development project			✔	
Challenges in Adapting Scrum in Legacy Global Configurator Project	✔	✔	✔	✔
An Agile Implementation within a Medical Device Software Organisation			✔	
Choice of Agile Methodologies in Software Development: A Vendor Perspective			✔	
A survey on agile practices in the Indian IT industry			✔	
Fit between Agile practices and organizational cultures			✔	

25 percent Ahead of Schedule and just at "Step 2" of the SAMI	✔	✔	✔	✔
Strengths and barriers behind the successful agile deployment—insights from the three software intensive companies in Finland	✔	✔	✔	
From RUP to Scrum in Global Software Development: A Case Study	✔	✔	✔	
Spearheading agile: the role of the scrum master in agile projects	✔	✔		
Blended Scrum model for software development organizations	✔	✔		
Digital Collections Are a Sprint, Not a Marathon: Adapting Scrum Project Management Techniques to Library Digital Initiatives	✔	✔	✔	
Scrum adoption and architectural extensions in developing new service applications of large financial IT systems	✔	✔	✔	✔
SCRUM for Hardware and Systems Development	✔	✔		
Agile in enterprise resource planning: A myth no more.	✔	✔		✔
Gamifying software development scrum projects	✔	✔	✔	
Challenges on Adopting Scrum for Distributed Teams in Home Office Environments	✔	✔		
Introduction to the Special Issue: The Day-to-Day Lives of Cultures and Communities	✔	✔	✔	✔
Agile Scrum Issues at LargeScale Distributed Projects: Scrum Project Development At Large	✔	✔	✔	

Title	Col1	Col2	Col3	Col4
Whose Experience Do We Care About? Analysis of the Fitness of Scrum and Kanban to User Experience			✔	
Why Agile can be a game changer for managing continuous innovation in many industries			✔	✔
Self-Organizing Roles on Agile Software Development Teams			✔	
Evaluating capstone project through flexible and collaborative use of Scrum framework			✔	✔
Understanding the Interactions between the Scrum Master and the Development Team: A Game-Theoretic Approach			✔	
THE CONTRIBUTION OF SCRUM IN MANAGING SUCCESSFUL SOFTWARE DEVELOPMENT PROJECTS	✔	✔	✔	✔
Why Agile can be a game changer for managing continuous innovation in many industries			✔	✔
Skiing and Boxing: Coaching Product and Enterprise Teams			✔	
Primavera gets agile: a successful transition to agile development			✔	✔
Is Water-Scrum-Fall Reality? On the Use of Agile and Traditional Development Practices			✔	
Rapid improvement of students' soft-skills based on an agile-process approach	✔	✔		
Blending Scrum practices and CMMI project management process areas			✔	✔

Title	Col1	Col2	Col3	Col4
A multi-faceted roadmap of requirements traceability types adoption in SCRUM: An empirical study	✔	✔		
Scrum Metrics for Hyperproductive Teams: How They Fly like Fighter Aircraft			✔	
Total:	34	34	35	17

Appendix B:

Issues/Uncertainties	Tally	Author
Change Resistance	9	David G. Ullman, Peter Clutterbuck, Ridewaan Hanslo, Rita Marques, Lucas Khoza, Martin Kalenda, Ayesha Khalid, Neda Kaleshovska, Ghada Alaa
Over-commitment from external pressure	17	Janeth Lopez-Martinez, Ridewaan Hanslo, Lucas Khoza, Artem Marchenko, Rory V. O'Connor, Ismael Edrein Espinosa-Curiel, Abdul Rauf, Christoph Matthies, Peter Clutterbuck, El-Mohanned Ahmed, Minna Pikkarainen, Ramon Noordeloos, Esra Cetin, Tuomas Ihme, Didier Casanova, Neda Kaleshovska, Ghada Alaa
Managing Environments	7	Saeedi Kawther, Artem Marchenko, Lucas Khoza, Abdul Rauf, Peter Clutterbuck, Marlon Luz, Ghada Alaa
Lack of organizational culture	13	Peter Clutterbuck, Ridewaan Hanslo, Lucas Khoza, Martin Kalenda, Georgia M. Kapitsaki, Rory V. O'Connor, Alemeida Fernando, Ismael Edrein Espinosa-Curiel, Janeth Lopez-Martinez, David G. Ullman, John Weeks, Ayesha Khalid, Eduardo Valentin
Quality assurance	12	Janeth Lopez-Martinez, Claudia de O. Melo, Lucas Khoza, Ridewaan Hanslo, Abdul Rauf, Rajeev Kumar Gupta, El-Mohanned Ahmed, Minna Pikkarainen, Ramon Noordeloos, Yogeshwar Shastri, Esra Cetin, Tuomas Ihme
Difficulty incorporating Non development tasks	11	Ismael Edrein Espinosa-Curiel, Lucas Khoza, Rita Marques, Claudia de O. Melo, Esra Cetin, Didier Casanova, Marlon Luz, Ayesha Khalid, Neda Kaleshovska, Eduardo Valentin, Ghada Alaa
Maintaining motivation	13	Ismael Edrein Espinosa-Curiel, Lucas Khoza, Ridewaan Hanslo, Artem Marchenko, Janeth Lopez-Martinez, Christoph Matthies, Minna Pikkarainen, Ramon Noordeloos, Esra Cetin, Rita Marques, Marlon Luz, John Weeks, Eduardo Valentin
Undefined objective	7	Minna Pikkarainen, Ismael Edrein Espinosa-Curiel, Claudia de O. Melo, Janeth Lopez-Martinez, Ramon Noordeloos, Didier Casanova, Neda Kaleshovska
Poor communication	19	Martin Kalenda, Peter Green, Rita Marques, Lucas Khoza, Ridewaan Hanslo, Artem Marchenko, Alemeida Fernando, Ismael Edrein Espinosa-Curiel, Janeth Lopez-Martinez, Abdul Rauf, Rajeev Kumar Gupta, Christoph Matthies, El-Mohanned Ahmed, Ramon Noordeloos, Tuomas Ihme, Marlon Luz, John Weeks, Ayesha Khalid, Ghada Alaa
Insufficient documentation	12	Claudia de O. Melo, Georgia M. Kapitsaki, Rita Marques, Ridewaan Hanslo, Artem Marchenko, Saeedi Kawther, Abdul Rauf, Ramon Noordeloos, Esra Cetin, Tuomas Ihme, Didier Casanova, Eduardo Valentin

Sprint Management	14	Artem Marchenko, Martin Kalenda, Rita Marques, Peter Green, Georgia M. Kapitsaki, Saeedi Kawther, Ismael Edrein Espinosa-Curiel, Janeth Lopez-Martinez, Abdul Rauf, Marlon Luz, Ayesha Khalid, Neda Kaleshovska, Ghada Alaa
Inconsistant agile implementation	10	Rory V. O'Connor, Rita Marques, Georgia M. Kapitsaki, Ismael Edrein Espinosa-Curiel, Janeth Lopez-Martinez, Yogeshwar Shastri, Esra Cetin, Didier Casanova, Neda Kaleshovska, Ghada Alaa
Lack of knowledge/skills	17	Claudia de O. Melo, Ridewaan Hanslo, Lucas Khoza, Peter Green, Rory V. O'Connor, Ismael Edrein Espinosa-Curiel, Janeth Lopez-Martinez, Rajeev Kumar Gupta, Minna Pikkarainen, Ramon Noordeloos, Yogeshwar Shastri, David G. Ullman, Didier Casanova, Marlon Luz, Neda Kaleshovska, Eduardo Valentin, Ghada Alaa
Poor Management support	16	Martin Kalenda, Rita Marques, Lucas Khoza, Ridewaan Hanslo, Peter Green, Georgia M. Kapitsaki, Claudia de O. Melo, Artem Marchenko, Rory V. O'Connor, Alemeida Fernando, Ismael Edrein Espinosa-Curiel, Abdul Rauf, Rajeev Kumar Gupta, Yogeshwar Shastri, David G. Ullman, Eduardo Valentin
Customer collaboration	12	Georgia M. Kapitsaki, Rita Marques, Ridewaan Hanslo, Martin Kalenda, Saeedi Kawther, Ismael Edrein Espinosa-Curiel, Abdul Rauf, Peter Clutterbuck, El-Mohanned Ahmed, Esra Cetin, Tuomas Ihme, Neda Kaleshovska

Appendix C:

Success factors	Strategies	Tally	Author
Management	Requirements management	26	Peter Clutterbuck, Ridewaan Hanslo, Rita Marques, Lucas Khoza, Jil Ann-Christin Klunder, Wantana Singhto, Martin McHugh, Noshiba Nazir, El-Mohanned Ahmed, Minna Pikkarainen, Ramon Noordeloos, Michael Dulock, Tuomas Ihme, Didier Casanova, John Weeks, Ayesha Khalid, E.L.C Law, Stephen Denning, Rashina Hoda, Rafael Tome de Souza, Tugba Karabiyik, Neda Kaleshovska, Sergey Prokhorenko, B. Schatz, Ana Sofia, Scott Downey
	Top management support	14	Alemeida Fernando, Rita Marques, Lucas Khoza, Jil Ann-Christin Klunder, Ismael Edrein Espinosa-Curiel, Peter Clutterbuck, Noshiba Nazir, Panuchart Bunyakiati, Minna Pikkarainen, Tuomas Ihme, Rashina Hoda, Neda Kaleshovska, B. Schatz, Georgios Theocharis
Adaption	Flexibility	25	Ismael Edrein Espinosa-Curiel, Lucas Khoza, Jil Ann-Christin Klunder, Peter Clutterbuck, Wantana Singhto, Sriram Rajagopalan, Noshiba Nazir, El-Mohanned Ahmed, Ramon Noordeloos, Michael Dulock, Tuomas Ihme, Didier Casanova, John Weeks, Ayesha Khalid, E.L.C Law, Stephen Denning, Rashina Hoda, Rafael Tome de Souza, Tugba Karabiyik, Neda Kaleshovska, B. Schatz, Georgios Theocharis, Ana Sofia, Scott Downey
Structured Plan	Choosing and customizing agile method	14	Peter Clutterbuck, Ridewaan Hanslo, Lucas Khoza, Jil Ann-Christin Klunder, Ismael Edrein Espinosa-Curiel, Christoph Matthies, Noshiba Nazir, Minna Pikkarainen, Ramon Noordeloos, Didier Casanova, Rashina Hoda, Sergey Prokhorenko, B. Schatz, Scott Downey
	Deploy Appropriate tools	10	Christoph Matthies, Ismael Edrein Espinosa-Curiel, Rita Marques, Peter Clutterbuck, Sriram Rajagopalan, Noshiba Nazir, Panuchart Bunyakiati, Rashina Hoda, Sergey Prokhorenko, Scott Downey
Knowledge	Training and coaching	15	Martin Kalenda, Lucas Khoza, Ridewaan Hanslo, Jil Ann-Christin Klunder, Alemeida Fernando, Rajeev Kumar Gupta, Peter Clutterbuck, Martin McHugh, Minna Pikkarainen, Rashina Hoda, Tugba Karabiyik, Neda Kaleshovska, Sergey Prokhorenko, B. Schatz, Ana Sofia

Communication	Transparency	25	Sriram Rajagopalan, Martin Kalenda, Rita Marques, Lucas Khoza, Ridewaan Hanslo, Jil Ann-Christin Klunder, Alemeida Fernando, Ismael Edrein Espinosa-Curiel, Rajeev Kumar Gupta, Peter Clutterbuck, Noshiba Nazir, El-Mohanned Ahmed, Ramon Noordeloos, Michael Dulock, Tuomas Ihme, Didier Casanova, John Weeks, Ayesha Khalid, E.L.C Law, Stephen Denning, Rashina Hoda, Rafael Tome de Souza, Tugba Karabiyik, Sergey Prokhorenko, B. Schatz, Georgios Theocharis
	Mindset and Alignment	22	Martin McHugh, Alemeida Fernando, Martin Kalenda, Ridewaan Hanslo, Rita Marques, Lucas Khoza, Ismael Edrein Espinosa-Curiel, Rajeev Kumar Gupta, Peter Clutterbuck, Wantana Singhto, Sriram Rajagopalan, Panuchart Bunyakiati, El-Mohanned Ahmed, Michael Dulock, Tuomas Ihme, John Weeks, Ayesha Khalid, E.L.C Law, Stephen Denning, Rashina Hoda, Tugba Karabiyik, B. Schatz, Georgios Theocharis, Ana Sofia