

CHANGE MANAGEMENT SKILLS PROGRAMME

**Accredited
course
information:**

Unit Standard ID	NQF Level	Credits
252020	5	6

252020

5

6

Create and manage an environment that promotes innovation.

**Accredited
course
information:**

Unit Standard ID	NQF Level	Credits
252026	5	6

252026

5

6

Apply a systems approach to decision making.

**Accredited
course
information:**

Unit Standard ID	NQF Level	Credits
252021	5	8

252021

5

8

Formulate recommendations for a change process.



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PRE-ASSESSMENT MEETING CHECKLIST

Your facilitator/assessor will go through the below checklist with you. Please (✓) in the space provided to confirm that the points where discussed.

#	POINTS TO BE DISCUSSED	✓
Did the facilitator/Assessor:		
1.	Provide a clear explanation of Outcomes-based assessment and the NQF system.	✓
2.	Explain the assessment process and the principles of good assessment practice.	✓
3.	Explain the roles and responsibilities of the learner, assessor and moderator.	✓
4.	Explain the learner's rights, discuss the appeals process and assessment policies	✓
5.	Ensure the learner was ready for the assessment by conducting formative assessment	✓
6.	Provide the Learner with a copy of the unit standard against which they will be assessed	✓
7.	Discuss and identify any special needs of the learner	✓
8.	Discuss the VACS evidence requirements	✓
9.	Discuss the assessment planning and conducting document s indicating the evidence, methods, resources, timing and special needs	✓
10.	Discuss the importance of confidentiality if all the information.	✓
11.	Give the Learner an opportunity to seek clarification on any items discussed	✓
Learner Signature:		
Assessor Signature:		
Date of Meeting:	20/06/2023	

ASSESSMENT PLAN

This document is for **assessment purposes** only. You are only required to complete your name and sign once the Assessor has assessed your Portfolio and provided you with feedback.

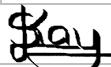
Note that Formative Assessments have been based on the EEK's applicable to the unit standards in this Cluster, hence the practical application has been addressed in the Summative Assessments only.

Date of Assessment	28/07/23							
Assessor Declaration C	The assessor at this moment declares that this document will be completed and a judgment made once all the evidence submitted according to this plan has been assessed against model answers and the VACS criteria							
Assessor Name	Nokuthula Shange			Assessor signature				
Moderator Name				Moderator Signature				
Learner Name	Sean Kay			Learner Signature				
Mentor/ Facilitator Name	Nokuthula Shange			Mentor/ Facilitator		Signature		
Key to Methods	Obs	Observation	Q	Questioning	PE	Product Evaluation	LB	Logbook

FORMATIVE ASSESSMENT ACTIVITIES



Learner Instruction: Please complete the following checklist to indicate that you have completed all the formative assessment activities required for your portfolio. These activities must have been completed on the DigiAssist System and evidence of each outcome pdf printed signed and placed behind this page.

#	FORMATIVE ASSESSMENT ACTIVITY	TICK TO CONFIRM COMPLETION
1	Formative Assessment Activity 1	✓
2	Formative Assessment Activity 2	✓
3	Formative Assessment Activity 3	✓
4	Formative Assessment Activity 4	✓
Learner signature:		
Assessor signature:		
Moderator signature:		

SUMMATIVE ASSESSMENT



Learner Instruction: Please complete the following checklist to ensure that you have completed all the summative assessment activities. These activities should be completed in full and as per instructional video provided after the Cluster, ensure to have full understanding of what is required before attempting these activities.

SUMMATIVE ASSESSMENT ACTIVITIES

#	SUMMATIVE ASSESSMENT ACTIVITY	TICK TO CONFIRM COMPLETION
1.	Summative Assessment Activity 1	✓
2.	Summative Assessment Activity 2	✓
Learner Signature:		
Assessor Signature:		
Moderator Signature:		

SUMMATIVE ASSESSMENT ACTIVITY 1: KNOWLEDGE ASSESSMENT



252020 SO1 AC 1, SO 2, SO 3 AC 1

252021 SO 1 AC 1, SO 3

EEK: All

CCFO: All

Assessment Method: Questioning

INSTRUCTIONS: Use the method as explained in your POE Instructional Video from Cluster 1 to complete the questions.

1. Which of the following features that promote innovation are not evident in your work environment? Explain why you say they are not evident.
 - a. Openness
 - b. Creative Thinking
 - c. Questioning
 - d. Encouragement to risk taking
 - e. Rewards for innovation
 - f. Culture of enquiry
 - g. Challenge the facts
 - h. Learning from mistakes
2. What creativity and innovation techniques are being applied in your workplace? Explain using 3 techniques of why these techniques are being used or not. If nothing is being applied explain which techniques could be used and why they are suitable.
3. What is the role of a unit manager in creating an environment conducive to innovation? Describe this role ensuring to refer to continuous improvement and innovation of the unit.
4. What is change and the impact on organisational sustainability? Give reference to internal and external environmental change that would affect your specific unit.
5. If you could choose two change models, which would you choose and why? Explain referring to appropriateness for different change processes.

Feedback to Learner:

Well done

VACS Assessment of Evidence	✓	✗	✓	✗
The result of the First Assessment	✗	NYC	Date 27/08/23	
Result of Second assessment	C	NYC	Date	
The result of the Third Assessment	C	NYC	Date	
Learner Signature:	\$Kay		Date 28/07/2023	
Assessor Signature:	Change		Date 28/07/23	
Moderator Signature:			Date	

SUMMATIVE ASSESSMENT ACTIVITY 2: ASSIGNMENT



US 252020 SO 1 AC 1 – 4, SO 3, 4
US 252026 SO 1 – 4
US 252021 SO 1 AC 2, SO 2, SO 3 AC 2, SO 4
EEK: All
CCFO: All
Assessment Method: Product Evaluation

INSTRUCTIONS: Use the method as explained in your POE Instructional Video from Cluster 1 to complete the questions. You may use formal downloadable templates for this activity, ensuring that all elements as prescribed are evident in the document.

Special Instructions: This may be a simulated activity to ensure that all elements are included in the assignment. The assignment has been logical ordered to:

- a. Analyse a unit for opportunities for innovation
- b. Solve a problem if opportunities are not being implemented
- c. Formulate a change recommendation
- d. Create a change implementation plan

TASK 1

Do the following:

1. Plan to analyse your unit for opportunities for innovation, the analysis should include:
 - a. Objective
 - b. Features that should be present in the environment
 - c. Description of features not there and why they should be to promote a conducive innovation
 - d. Findings on the analysis
 - e. Areas for improvement
 - f. Recommendations to implement change
 - g. What techniques of creativity and innovation can be applied to promote this?
 - h. Roles of the unit management in creating this environment.
2. Arrange a meeting with the role players to discuss your findings and promote the implementation plan.

Provide the following as evidence:

1. A neatly professionally prepared planning document encompassing all the information in a – h above.
2. A transcript or minutes of the meeting held with role-players to discuss and promote the plan.

TASK 2

You found some features lacking in the environment to promote a conducive innovative environment. This is a problem as your organisation prides itself on innovation and wants an improved innovative environment.

Do the following:

1. Draft a document in which you outline the problem by ensuring to include all elements of the problem – The problem statement, cause and effects of the problem, etc.
2. Arrange a meeting with your team to discuss the problem, analyse and decide on possible solutions.
3. Document the problem-solving process of the meeting to create a professional document, to produce to management.
4. Develop a change management plan to implement the changes that need to make because of the solution decided on. Ensure to have followed all the change management process activities.
5. Arrange a meeting with management or team to discuss the implementation of the change.

Provide the following as evidence:

1. A professional document in which you document the problem, the causes and effects of the problem, the alternative solutions as well as an analysis of the best possible solution. Ensure that you have gone through all the phases in the problem-solving process, to maximise benefit of the solution.
2. A professional documented change management plan with implementation strategy.
3. Minutes or transcripts of both meetings for the problem-solving session and the change implementation.

Feedback to Learner:

Excellent execution

VACS Assessment of Evidence	✓	✓	✗	✗
The result of the First Assessment	✗	NYC	Date 28/07/23	
Result of Second assessment	C	NYC	Date	
The result of the Third Assessment	C	NYC	Date	
Learner Signature:			Date 28/07/2023	
Assessor Signature:			Date 28/07/23	
Moderator Signature:			Date	

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LEARNER EVALUATION OF THE ASSESSMENT PROCESS

Kindly complete the form below to provide feedback to the assessor

Please answer the following questions by ticking the applicable box		
Criteria	Yes	No
Did the assessor go through the assessment meeting with you?	✓	
Did the assessor explain the reason for the assessment	✓	
Did you receive a copy of the Unit standard/s you were being assessed against	✓	
Did the assessor explain the assessment methods and criteria?	✓	
Where the instructions for each assessment clear?	✓	
Did your assessor provide you with developmental feedback?	✓	
Do you agree with the feedback?	✓	
Additional Comments:	No comments	
Learner Name	Sean Kay	
Signature:		
Date:	28/07/2023	

DEVELOPMENT PLAN

To be completed by the Assessor.

Assessor it is important to provide the learner with direction, development, and growth. Observation during the process will assist in completing this for the learner. Take note of time management, self-esteem, confidence, organisation, self-management and discipline.

Learner Name	Seun Kay
Assessor Name	Nokuthula Shange
Programme Name:	Generic Management L5
Date:	28/07/23
Areas of development and additional evidence required	

All outcomes met

Resubmission date:	n/a
Learner Signature:	
Assessor Signature:	

SUMMATIVE ASSESSMENT ACTIVITY 1

TASK 1

2023

11 JULY 2023

WLA

Authored by: Sean Kay

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Summative assessment

Activity 1: Knowledge assessment

1. Which of the following features that promote innovation are not evident in your work environment? Explain why you say they are not evident.
 - a) Openness
 - b) Creative thinking
 - c) Questioning
 - d) Encouragement to risk taking
 - e) Rewards for innovation
 - f) Culture of enquiry
 - g) Challenge the facts
 - h) Learning from mistakes

Answer: I believe that d) Encouragement to risk taking and e) Rewards for innovation are not evident within my work environment. Our specialised engineering company has a specific target market, being structural remediation, and as such our client base is quite focused. This subconsciously guides us (management and employees) to continue along the same work ethic as our senior directors and therefore reduces the need to take risks. In engineering, risks need to be calculated as there are severe consequences should something go wrong. This being said, these calculated risks are not in the forefront of our decision-making process and if a mindset shift toward risk-taking is implemented then this could potentially lead to widening our market reach. Which will then enable a system for reward for innovation. Our current reward system is based on that of billable hours and should be revisited to include innovation and creativity instead. The two options I have chosen are therefore interlinked and could both draw good growth within the organisation and increase turnover should more clients become available through out of the box thinking and a more motivated employee.

2. What creativity and innovation techniques are being applied in your workplace? Explain using 3 techniques of why these techniques are being used or not. If nothing is being applied explain which techniques could be used and why they are suitable.

Answer: Our current technique is that of traditional brainstorming, it should be said that this is not a formal or planned session and only arises if problems are encountered on a project. The outcome is generally good and there are lessons learnt. Only specific team members are consulted depending on the project issue. I feel that formal planned sessions would be beneficial and time should be made to ensure all creative and innovative ideas are discussed and provided to management (could be organisational improvement ideas or job specific improvement ideas to start).

As individuals with technical backgrounds, the other two techniques I feel would work best are that of Challenge of the fact and Edward De Bono's 6 thinking hats. The 6 thinking hats would force us to T.N.

explore multiple ways of thinking which would assist in generating ideas from all perspectives and force us to think outside of our normal train of thoughts (i.e., from logical to emotional to creative). The Challenge of facts technique is also appealing in the way it approaches engineering in particular, technology improvements continue to impact our specific field (structural), however, we sometimes stick to the saying of 'don't fix it if it is not broken'. This links to the lack of risk taking due to the possible consequences. If we are able to challenge set ideas to improve or develop new techniques to achieve better results, then we should not be afraid to bring it to the team. This technique will therefore improve employee interactions and create an environment conducive to idea generating. Technological advancements will also lead to individual competency improvements as they would be more interested in researching a topic of interest to them.

3. What is the role of a unit manager in creating an environment conducive to innovation? Describe this role ensuring to refer to continuous improvement and innovation of the unit.

Answer: In our particular company, the unit manager plays a vital role for the team. Each unit manager deals with multiple projects and team members and knows exactly what should be done. They need to be able to show openness to communication, be able to develop their team (professionally), be understanding and sympathetic and provide feedback to other managers in order to improve on any lessons learnt. They need to be up to date with developments and identify opportunities within their segment and for the organisation. The unit manager should be able to implement creative thinking techniques as they are directly involved with all facets of the organisation (as our company is relatively small, the directors can be seen as the unit managers). A shift in thinking to ensure creativity and innovation is definitely something to pay attention to, if the unit manager is able to apply these creative thinking and innovation techniques then the team and the organisation will be better placed to achieve a goal of reaching more clients and improving on current systems by becoming more competitive in the marketplace. This will also directly improve employee involvement, teambuilding and create an opportunity for rewards. With the unit manager steering the ship(s), the favourable ideas can become part of the system and then be rolled out if successful, so they are vital to the innovation process.

4. What is change and the impact on organisational sustainability? Give reference to internal and external environmental change that would affect your specific unit.

Answer: As a director, my unit would be the organisation. An important change that would affect me and the organisation, both internally and externally, would be that of our senior director retiring. This change would affect the organisation in multiple ways: internally there would be a potential knowledge transfer gap (as he has a wealth of experience), have financial implications (payments) and inevitably affect organisational decision making; externally this would affect the organisations stakeholder engagement and client relationships (as he started the company and has multiple invested clientele that trust his judgement). If this change is not managed accordingly, then the sustainability of the

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organisation could be severely affected and could result in a loss of revenue and possibly more. Due to the structure of the organisation, this could easily affect the company's direction.

5. If you could choose two change models, which would you choose and why? Explain referring to appropriateness for different change processes.

Answer: The first model I would choose is the Kaizen Philosophy of Continuous Incremental improvements. Having some Asian blood, I am instinctively drawn to this model. The word meaning changing for the better indicates exactly why it is suitable for our organisation. Small incremental changes aimed at continual improvement for me means that all parties (internal and external stakeholders) will benefit from improvements over time. As a well-established organisation, drastic changes will not be favourable and could be discouraging to long listed clientele. With this method, each employee and management will be able to identify small changes to their own style of work. This alleviates the pressure of being forced to come up with a drastic change and encourages personal growth. From an online article by Lean Enterprise Institute (www.lean.org/lexicon-terms/kaizen/) there are 8 steps that can easily be done by everyone, these are: Background information, Current-state definition, Current-state analysis, Goals, Target-condition definition, Implementation plan, Check results and Follow-up and standardise. They also describe the Kaizen event which is very useful for teambuilding and inspiring innovation. The event has very specific outcomes, such as, implementation and finally standardisation of work which means the event should result in action. This long-term approach of continuous improvements has been shown to have multiple benefits like an increase in efficiency, an improvement of quality and a more motivated workforce. The leaders/managers are however required to provide the baseline to ensure targets are measurable and to track improvements. This method could be used to implement technological advancements within our industry.

The second method would be the more drastic approach of Kurt Lewin's Change model – freeze, change, refreeze. This method is generally considered for swift change and involves the process of unlearning and then relearning. I would consider this model to restructure our current systems and to create buy-in and motivate moving in a new direction chosen by management. This will improve employee integration should a drastic change be required i.e., if the company is restructured due to senior director retirement. New visions and goals could become necessary if the existing directors put innovation and technology at the forefront. This will inevitably bring out restraining and driving forces and guide individuals to relearn new processes and/or systems. I believe this method can be utilised in this particular instance but my preference would be that of the Kaizen method.

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SUMMATIVE ASSESSMENT ACTIVITY 2

TASK 1

2023

25 JULY 2023

WLA

Authored by: Sean Kay

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Opportunities for INNOVATION

Objective

Innovation is required to expand and improve an organization. This document covers the essential planning needed to analyse our unit/organization for opportunities for innovation.

Technological advancements within the field of structural/civil engineering is vast and every improving, it is one such avenue with potential to move our organisation forward. Therefore, I propose to analyse and determine if the introduction of technological advancements would be a catalyst for sparking creative thinking and instil the need for innovation within our organisation.

As our main focus is structural assessment and rehabilitation, this will become the focal point of the discussions below and be the centre point for the structure of the planning.

Requirements for an Innovative environment

As per the Training Force Learner Guide (2023), in order to analyse a unit for innovation there are a number of key elements and features that should be present in the environment. These elements include that of collaboration, responsibility, experimentation, value-focus, be autonomous in nature and be transparent to all stakeholders. The features that accompany these elements are encouragement, promotion of openness, allowance for creative thinking, challenge of facts, having a culture of enquiry, being rewarded for ideas and allowance for learning through mistakes.

Within our organisation there is already a sense of openness, collaboration, transparency, responsibility and value/customer focus, however, only an informal sense of experimentation, creative thinking, challenging of facts and rewarding of ideas. This analysis hopes to unlock innovation and provide a more formal means to implementing creative thinking and the rewarding thereof, whilst still ensuring organisational growth. Often companies/organisations become stagnant due to complacency of management, its employees and current customer relationships (including project landscape). This may have resulted from having a 'winning recipe' but will not allow the organisation to move forward and continuously improve.

I believe that introducing technological advancement(s) will significantly improve our company foothold within the industry, spark enthusiasm from employees and allow for reward programmes to be implemented. Technology will significantly impact our visual assessment portfolio, our non-

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destructive testing capabilities and possibly allow another avenue such as laboratory testing (future vision).

Promoting an environment conducive to Innovation

As our organisation is technically minded with engineering backgrounds, calculated risks are generally considered but creative thinking is not always top of mind. This is likely due to the consequences of failure being significant, however if employees become autonomous and experimental, then I believe that new and innovative ideas will flourish and improve their efficiency within the workplace. This will diminish the perception that the current way of doing things is the most efficient and that management will be eager to consider ideas that will improve the business and/or aid organisational growth (improve financial and business culture). This will enable management to consider reward schemes and further improve employee buy-in.

Analysis and findings

Creative thinking and innovation can significantly impact our current business model. It will allow all stakeholders to look for areas of improvement and then be rewarded for well thought out implementable ideas whilst not dismissing other ideas. All ideas, from small continuous changes to large impactful changes are important and must be taken into account.

Improved buy-in and overall efficiency can be achieved by considering technological advancements to move the business forward with the times. Certain advancements will have the added benefit of upskilling and training individuals and/or teams and allow employees to explore avenues of interest to them (while keeping in line with or improving on the company strategy).

Financial implications and analysis will then be done on each implementable idea brought to the unit manager/team lead and then should be presented to senior management for consideration.

Areas for improvement:

Technological advancements within our engineering field need to be thoroughly researched to ensure the most feasible and most suitable technology is considered. Due to the fast pace of technological improvements, this research needs to be an ongoing process.

The team needs to improve/implement creative thinking sessions to ensure the correct solutions are found that will address all their needs. A focus on technological advancement does not imply that the outcome must be to purchase the most advanced drone or most sophisticated ground penetrating

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radar equipment but rather focus on technology that will directly improve their workflow and enhance their capabilities. New business branches/avenues will come after a baseline has been established.

A SWOT analysis was done specifically aimed at innovation considering technological advancements:

Strengths: <ul style="list-style-type: none">Technically strong capable team that can easily adapt to new technology implementation.Openness to new ideas (informal nature currently).Strong existing clientele.	Weaknesses: <ul style="list-style-type: none">Lack of innovative idea generation and rewarding thereof.Lack of formal creative thinking sessions.No formal implementation processes.
Opportunities: <ul style="list-style-type: none">Create an innovative environment to potentially expand market reach.Upskilling and training improvements.Increase in technological know-how.	Threats: <ul style="list-style-type: none">Financial implications could be significant if there is no buy-in from clientele.Frequent technological advancements could result in outdated purchasing.Competitive landscape (specifically for drone surveying).

Recommendations to implement change:

1. Create awareness and buy-in for creative thinking and innovation (kaizen method of small incremental changes may be best fit for our organisation). Kaizen method encourages everyone to identify areas for improvement and come up with practical solutions, this method is good as it does not require drastic changes so will be easily implementable.
2. Manage the outcome of the sessions and have a clear goal.
3. Team leader to analyse the chosen solution and present to senior management.
4. Provide team with senior management thoughts and feedback.
5. Senior management to implement and enforce the changes (even if it's a small change), as this will show commitment.
6. Reevaluate the change after implementation and track/implement any amendments needed.
7. Do not discourage the team if idea is not in line with company strategy but encourage them for alternative solutions.

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Creative thinking techniques:

Brainstorming – although this is widely used, we use it for project specific discussions, it does not always allow for multiple thought types and could result in bias opinions becoming dominant. I would only recommend using this technique when impromptu solutions are required (i.e., where a time constraint is imposed).

Edward De Bono's 6 Thinking Hats appears to be a great tool for ensuring a more seamless approach when having a team of diverse backgrounds and thinking styles. As our organisation is quite diverse, this tool will create a more focused approach to thinking.

The 6 Hats consists of the following thought requirements:

- White Hat – Looking at data, pure facts and figures are considered.
- Red Hat – Emotions, hunches and intuition are considered.
- Black Hat – Cautious approach, negative judgement, devil's advocate.
- Yellow Hat – Optimism, positivity and opportunity considerations.
- Green Hat – New and innovative ideas.
- Blue Hat – Order, control, process, conclusions (generally chair of meeting).

This method covers all aspects of the creative thinking process and can be easily implemented. It is better suited than brainstorming as there are several focused thought processes which is ideal to finding the most amicable solution(s). For our case of technological advancement, we can focus on a diverse set of thoughts and not just rely on emotions (which generally arise from new gadgets/technology). After this technique has been found to be successful then Edward De Bono's 6 shoes technique can be used to take action.

Role of the unit manager:

The unit manager will have access to his team but does not always understand how each individual is feeling. He/she will be able to assess the individual's performance but is sometimes unable to establish a relationship. The creative thinking tools will create a means of accessing team feelings and overall work perceptions without the feeling of judgement from senior management. The unit manager/team leader is therefore key to the successful implementation and team buy-in for an innovative environment. The unit manager is responsible for providing guidance in line with company strategy/vision and is the spokesperson to senior management. He/she is also required to communicate back to the team on decisions made and is responsible for tracking the implementation of the agreed ideas.

The unit manager is therefore vital to creating and maintaining an innovative environment.

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I would propose that each unit manager arrange a quarterly creative thinking session to enable each of their team members to ease into the process. The first couple of sessions can be to establish a baseline and highlight areas of concern/improvement (this could also include thoughts on reward incentives). Subsequent sessions can then focus on innovation and solution finding (i.e., use of technology only after exact areas of improvement have been established). This needs to come from team doing the work, as management might not fully understand problems currently being endured by the team. Example, senior management might see thermal drone imagery as being important, but this might not be easily interpreted by team doing the actual capturing and could result in important areas not being interpreted or captured correctly.

Conclusion:

Our organisation is lacking in innovation and has become stagnant in its growth (technologically). This technological stagnation is currently financially successful but has the potential to become more efficient and explore more business opportunities through technological advancements within the industry.

As technology is broad and has many possibilities, we require creative and innovative ways to overcome current inefficiencies and improve our capabilities. One way to overcome this obstacle is to allow a structured approach to gain valuable employee thoughts and ideas. Creating an environment where there is reward for creativity and innovative solutions to move our organisation past our direct competitors and open new revenue streams (increased technical capabilities through advanced tools/equipment will allow for more options available to the client).

Significant well-planned research and creative thinking sessions should be the first step in our technological advancement, there is little financial implications to setup these sessions and the result will be that of gained valuable information regarding the team, current work dynamic and most suitable ways to improve team efficiency.

Next phase will be to hold creative thinking sessions, followed by problem-solving sessions and ultimately formalise change management plans in line with plausible innovative ideas that will move the organisation forward.

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**TECHNOLOGICAL INNOVATION IS KEY TO MOVING THE ORGANISATION FORWARD
AND EXPANDING MARKET REACH**

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TEAM MEETING MINUTES

Location: HQ
Date: 25/07/2023
Time: 10:00am
Facilitator: Sean Kay

Agenda items

1. Discussion on the introduction of creative thinking and innovation within our organization.

Jan: Not all engineers are capable of creative thinking due to the nature of their personalities and educational backgrounds – will this have an effect on the process of innovation?

Sean: There are certain techniques available to enable the creative thinking process to be implemented, such as the 6 Hats method where all members are given guidance on the way they should think (i.e., emotionally, logically, facts, positive and negative perceptions etc.). Also, we can possibly enable each individual to make small changes at first to ensure buy-in before implementing any drastic changes. This process is to move the organization forward but we can start by moving each individual forward (slowly toward getting innovation to be on top of mind).

Jacques: Plan to move company toward first world competitors is definitely to incorporate technology. NDT technology and laboratory testing in places like the USA is on a completely different level to our local landscape and if we want to get to that level then we need to market and bring these advancements to our clients so that we create opportunities. So the idea of innovation is a great tool we can implement.

2. Thoughts on the chosen technological advancement idea as an opportunity for innovation.

Jan: Benefits are there in theory but careful consideration as to why some competitors subcontract the service instead of offering the service directly (specifically for drone piloting and ndt services (gpr scanning)). Possibly that the workload does not justify the operational costs?

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Jacques: Technology coupled with our engineering judgement is key to our extended success.

Sean: This is a planning session so detailed analysis needs to be done, which is essentially a long-term (1 year) process. This is to ensure sufficient market research and financial feasibility is obtained prior to any decision making or purchasing. During this time the client and competitor landscape needs to be evaluated as well.

3. General thoughts

Value is seen by all participants; however, a trial run/creative thinking session could perhaps be the starting point to ensure all team members are involved in the thought process behind innovation and there is sufficient buy-in by all. Technically minded individuals may become stressed so an informal setting should be found.

Sean: The plan should be reviewed further to ensure all is happy to move onto the next phase of problem-solving and implementation of a plan.

Our organization is headed in the right direction and does not want to stagnate. Technology drives efficiency improvements so I believe that initial cost may be high (assuming here), but value added will outweigh costs (improved market reach, upskilling of employees and improving capabilities/offerings with the times). The creative thinking and problem-solving sessions will be focused on finding solutions to improving our current way of working (and thinking) so this should not be an issue for technically minded individuals (if it does not work then we can perhaps consult an external body to conduct the sessions for us which could be tailor made to our specific organization).

Action items	Owner(s)	Deadline	Status
Planning document	Sean Kay (Director – structural)	25/07/2023	✓ Complete
Review of plan	Jan Coetzer (Technical lead – inspection unit)	26/07/2023	Action item
Review of plan	Jacques Louw (Director – structural)	26/07/2023	✓ Action item T.N.

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Review of plan	Werner v/d Westuizen (Technical lead – projects)	26/07/2023 	Action item

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SUMMATIVE ASSESSMENT ACTIVITY 2

TASK 2 – Problem-solving

2023

26 JULY 2023

WLA

Authored by: Sean Kay

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Improving Innovation and Implementing Change

As technology improves, we should adapt and use these advancements in creating a more efficient and effective means of conducting our current work and in tackling more complex future work.

Problem statement

I have identified the following as an area we can improve on within our structural assessment/inspection unit (but can be applied to the organisation wholistically).

Inefficiencies in our visual assessment system leads to longer time spent on projects and the possibility of missing important structural elements that then require revisiting.

Cause and effect of the identified problem

Out-of-the-box thinking is not always the first thing that comes to mind when considering the field of structural engineering, specifically for visually assessing these structures. The task seems straight forward – visually look at the structure, note defects and provide a report on the findings. However, more is required from an engineering perspective – what is causing the defect? What is likely to happen if the defect remains? Is there a structural collapse or safety concern? All of these factors must be considered when doing the assessment and this becomes a significant challenge for interpretation/engineer intervention if data is not captured correctly.

Data capturing is however currently limited to accessibility constraints (most capturing is done using a handheld camera from ground level). This limits interpretation of structural defects that may be occurring on areas out of range – these areas then require expensive access (cherry picker, rope access or subcontracting drone surveyors) to be arranged in order to complete the evaluation.

Accessible areas generally take some time to visually assess and requires experience, often leading to long time spent on site and then similar time spent on interpreting images. Large complex structures take even longer to capture.

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Required outcome

Considering the identified problem, key desirable outcomes would be:

- Fast inspection turnaround time,
- High accuracy of data collection and accessibility to all parts of structure being inspected,
- Upskilling of technicians doing inspections (improved training and technological knowledge), and
- More time to reflect and focus on job specific areas of improvement.

Although our inspections are done to the best of our abilities and our work is of high regard, we can always improve. As a relatively small operation, we should be striving toward a quicker project turnaround time to alleviate valuable resources to be utilised for targeting the next project(s) whilst also improving on the output of the actual inspection scope. The inspections require covering multiple scenarios to properly identify probable causes of structural defects, hence after initial drafting of findings there is intervention and review by senior engineers to ensure these important findings are correctly addressed. This is at times challenging if images taken (from a handheld camera) are not able to capture the entire structure being investigated. This challenge is directly related to accessibility constraints i.e., some structures are tall and do not have a cat ladder or platform to enable the inspector to take detailed images. The inspectors could also learn valuable skills from these inspections if senior engineers had more time to focus on training and upskilling.

Time constraints impact employee's abilities to consider creative thinking or innovation, hence if we are able to reduce time spent on work activities then employees will be able to have sessions and become more involved in improving the overall work environment.

Analysis and findings

All of the aforementioned factors can be overcome by reducing time spent on inspections while maintaining high standard of data capturing. This can be done by either increasing resources or utilising available technology to our advantage.

- Resources could include increasing the number of employees, obtaining equipment/plant to access all parts of the structure (not always feasible) or training individuals to do rope access (where they can repel down the face of a structure – also not always feasible as there is additional equipment and safety to consider).
- On the other hand, technological advancement could be through the use of drone technology. Startup costs could be high as this includes the drone and various lenses as well as enrolment into a drone pilot training academy to obtain a license to fly commercial drones.

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A team session was held where a cause and effect diagram was done to ensure alignment of possible solutions. A summary of the findings can be seen in the below table.

Option	Pro's	Con's
Improved camera	<ul style="list-style-type: none"> Better quality pictures with a higher zoom capability 	<ul style="list-style-type: none"> Can only assess where access is granted (i.e., no improvement in accessibility constraints). Camera cost can become significant. Site conditions could damage expensive camera.
Rope access	<ul style="list-style-type: none"> Employee upskilling. Accessibility improvements on high rise structures capable of anchor point installation. 	<ul style="list-style-type: none"> Safety requirements (including training costs). Consumables (anchors). Not all structures suitable.
Larger team	<ul style="list-style-type: none"> Accuracy of critical items will increase. Knowledge transfer if more experienced engineer is accompanying inspector. 	<ul style="list-style-type: none"> Salary. Accessibility not improved.
Cherry picker	<ul style="list-style-type: none"> Access to higher parts of structure. 	<ul style="list-style-type: none"> Limited reach of boom. High cost to purchase and maintain. Training requirements.
Drone technology	<ul style="list-style-type: none"> Access to all parts of structure so accuracy of data improved. Data capturing done at a fast pace without missing any vital areas. Senior engineer(s) can simulate structure without having to go back to site. Can be improved by changing lens quality (not necessary to purchase entire drone to upgrade). 	<ul style="list-style-type: none"> High cost depending on drone and lens used. Training (pilot license requirements) and higher salary. Legal requirements to fly drone in certain areas. Technology when purchased could become outdated later on.

A consensus was found and concluded on during the session and it was found that the benefits of technology seem to outweigh the aforementioned increase in resources as the drone usage will not be affected by the type of project/structure i.e., rope access can only be done on structures where there is sufficient capacity to have anchor points and the use of plant (such as a cherry picker) can only reach a certain height without becoming excessively expensive to own.

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All these options require training so if it boils down to overall cost then consideration for owning and operating drone technology is a higher contender.

Use of the drone technology will allow employee upskilling/training, reduce time spent on the actual inspection, access the entire structure and allow the business to tackle larger inspection projects (where we would usually have to subcontract out the drone survey, we can now offer the service directly to our existing clientele and open new survey avenues).

Hire options could be done for all except the improved camera as these services are currently subcontracted out when required. To hire only the tool (i.e., only the drone or cherry picker (no operator)) would still require extensive training.

Alternatively, we could go into a joint venture with an established pilot but this will require further training and inductions at our clientele's facilities which will need to be done yearly and the cost may not be sustainable.

Advantages of the solution:

For the inspection unit, the advantages of using drone technology can be summarised as follows:

1. Improve time spent on visual inspections whilst improving the accuracy of data collected.
2. Improve scope of work capabilities to increase marketability by tackling more complex projects.
3. Increase employee skills by training and research.

Conclusion and Recommendations to implement the solution

Consider all suitable drone options by researching all available technology and legal requirements (licensing, training and procedures to operate drones in certain airspace).

As we know there will be significant business improvement, the only factor would be the cost implication. Therefore, we need to evaluate a cost comparison for different scenarios of hire vs buy. These could include the following: training employee(s) + drone hire vs training employee(s) + drone purchase vs joint venture with reputable drone pilot company.

High level cost analysis:

Estimates on costs (actual costs on drones vary depending on type and lens requirements which requires more in-depth research):

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- Commercial Drone: R100,000.00 (Africa drone kings [DJI Matrice 200 V2 Drone - Africa Drone Kings | DJI Drone](#))
- Pilot license: R100,000.00 (Africa drone kings [South Africa — africanDRONE](#)) x 2 employees
- Maintenance: Assume R15,000.00 per year
- Salary increase: Assume R200,000.00 per year (payscale [Drone Pilot Salary in South Africa in 2023 | PayScale](#))
- Total: R515,000.00

Project estimate: Drone survey subcontractor cost = R100,000.00 per large structure (such as tall concrete smokestacks or silos) x 4 structures per year on average

- Total = R400,000.00 per year

Therefore, the start-up costs will be covered during second year of implementation (or after the inspection of 8 large structures), thereafter it will become profitable.

Recommendation:

If capital application is found to be feasible, then we would need to evaluate employee thoughts – specifically those who would be best fit to drive the initiative. This will also allow us to promote creative thinking techniques and the benefits thereof directly to the team and also allow management to evaluate if there will be a need to employ an already trained individual.

As technology advancement is generally rapid, I would promote this as a 1-year plan so as to cover any changes/improvements that may have occurred in the industry. These changes typically result in a reduction of cost in items being considered currently. This time frame will also allow for more accurate financial mapping of each option.

Plan:

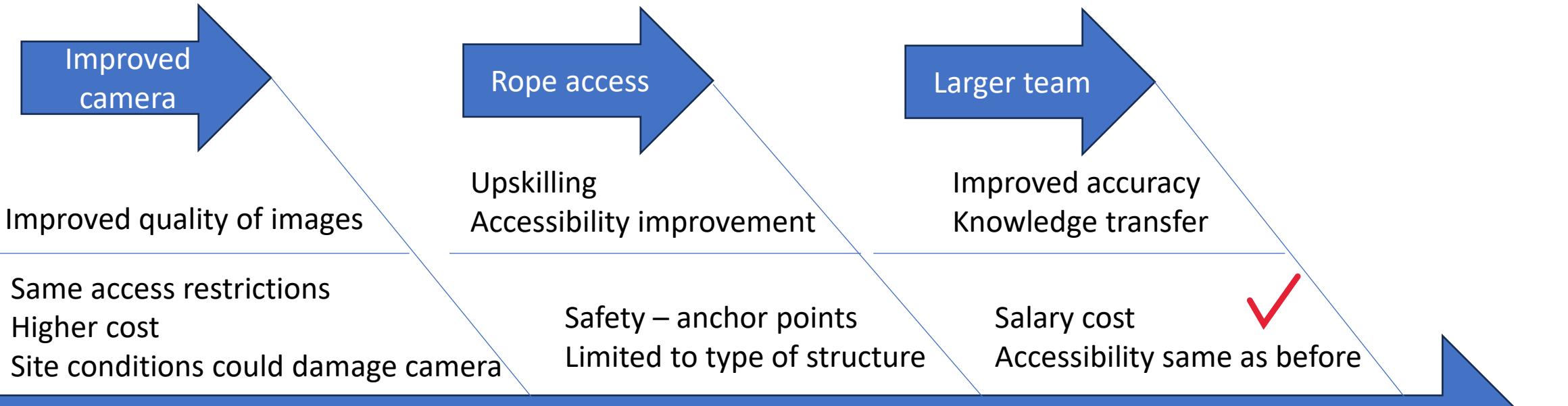
1. Review all legal requirements.
2. Approve implementation plan.
3. Approve solution progress at each stage (quarterly evaluation of costing update)
4. Assign unit manager/team leader with responsibility of selecting suitable pilots and obtaining training requirements.
5. Approve training schedule and costing.
6. Approve salary increase (depending on chosen candidate).
7. Approve licensing schedule and costing.
8. Marketing strategy for existing and new clientele to establish awareness of new technological capabilities.

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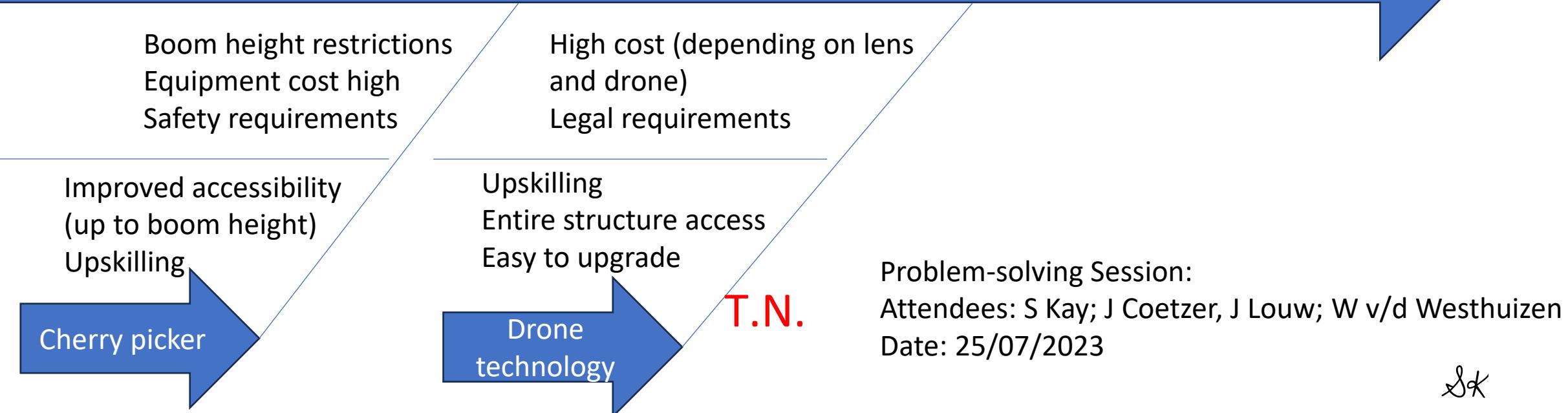
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DRONE TECHNOLOGY IS KEY TO IMPROVING STRUCTURAL INSPECTIONS

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Inefficiencies in our visual assessment system leads to longer time spent on projects and the possibility of missing important structural elements that then require revisiting.



TEAM MEETING MINUTES

Location: HQ
Date: 25/07/2023
Time: 12:00pm
Facilitator: Sean Kay

Agenda items

1. Problem-solving session to identified problem as found by Sean.

All participants took part in the cause and effect diagram method of problem solving where the advantages and disadvantages for each possible solution was brainstormed and incorporated into the diagram.

Each possible solution was discussed in detail and the most plausible solution appears to be that of utilizing drone technology – however, this is high level and requires further research to ensure all costing and benefits are analyzed and found to be feasible.

Jan concerned that competitors are outsourcing the pilots so we need to research as to why they do not have this function in-house.

Johan stated that it would be beneficial to let a senior engineer run through a captured structure with the technicians in detail to teach them how to look at defects and how to determine causes during capturing – links to upskilling. Also, we need to make sure that the drone inspection will not take more time (as batteries must be changed, there are connection requirements and piloting the drone may take time).

Sean: From experience with the subcontractors, the drone capturing is much faster than our standard inspection method, experienced piloting and adequate preparation (having batteries that are charged and ready to go) always result in time saving.

2. Roll out of similar sessions to other team members

Senior management comment is that we need to ensure proper planning is done so that sessions can occur during off-peak seasons (i.e., when shutdown activity is complete and when large projects are concluding). Consensus on benefit even if for teambuilding and affirming management openness to idea consideration.

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3. General thoughts

Session was well received and all who attended gave positive feedback to the facilitator. Definitely a start for buy-in by key role-players.

Sean to amend problem-solving document to include summary of session findings.

Action items	Owner(s)	Deadline	Status
Amend Problem-solving document	Sean Kay (Director - structural)	26/07/2023	In progress
Review of document	Jan Coetzer (Technical lead – inspection unit)	26/07/2023	In progress 
Review of document	Jacques Louw (Director – structural)	26/07/2023	In progress
Review of document	Werner v/d Westhuizen (Technical lead – projects)	26/07/2023	In progress
Review of document	Johan Becker (Structural engineer)	26/07/2023	In progress 

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SUMMATIVE ASSESSMENT ACTIVITY 2

TASK 2 – Change Management Plan

2023

27 JULY 2023

WLA

Authored by: Sean Kay

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Change Management Plan – Implementation of Drone Technology for Structural visual assessments

This change management plan is the central document by which the project is formally managed. The project being the implementation of drone technology to improve our structural visual assessment function and promote innovation within our organisation.

This change is necessary as our current system relies heavily on employee ability (of which is great but sometimes people miss minute details that could influence recommendations). The use of technology to capture the entire structure will eliminate any human error during site evaluation activities and also enable upskilling activities through training.

This change management plan will include:

- A description of the major phases undertaken to complete the implementation process.
- A schedule of the activities, tasks, durations, dependencies, resources and timeframes.
- A listing of the assumptions and constraints identified during the planning process.

Planning basis

Innovation is required to ensure the organisation does not stagnate and fall behind our competitors. As we specialise in structural/civil engineering, we have a team of highly trained technically minded individuals, however we require technological advancements to elevate our team and improve our overall market reach. One such advancement is the use of drone technology to improve our visual assessment capabilities and minimise the issues found with our current system.

Scope

A change to the current system being used to conduct structural visual assessments is hereby proposed. Creative thinking and problem-solving techniques were employed to analyse the inspection unit for a potential lack of features that promote an innovative environment. The outcome of which was in line with technological advancements and possibly implementing the use of drone technology to improve both efficiency and accuracy of the final product to the client.

A change management plan is therefore required to standardize the process of evaluating the proposed change, monitoring its development progress and tracking the various stages of action items. This is needed to create accountability and ensure these innovative ideas are considered throughout the full lifecycle.

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Milestones

Major events (milestones) envisioned for the implementation strategy are as follows:

- Planning document approved.
- Problem-solving document approved.
- Detailed feasibility study approved.
- Training Team appointed.
- Purchasing of drone technology
- Marketing

Description of key milestones:

Milestone	Description	Delivery Date
Planning document approved	The planning document highlighting the need for technological advancement was approved by the project sponsor (Director)	26/07/2023
Problem-solving document approved	The problem-solving document highlighting the chosen solution (drone technology) was approved by the project sponsor (Director)	26/07/2023
Detailed feasibility study approved	Long-term (1 year) plan. Requirements highlighted in the problem-solving document.	26/07/2024
Training Team appointed	Long-term (1 year) plan. Requirements highlighted in the problem-solving document.	26/07/2024
Purchasing of drone technology	Long-term (1 year) plan. Requirements highlighted in the problem-solving document.	26/07/2024
Marketing	Continuous process to ensure market/client buy-in.	26/07/2024

Phases

Envisioned project phases for implementation of Drone technology

Phase	Description	Sequence
Project Initiation	Defining the project by developing a business case (planning and problem-solving documentation)	Phase # 1
Project planning	Detailed feasibility study, team appointment	Phase # 2
Project execution	Purchase of equipment, training initiation, licensing procurement	Phase # 3
Project closure	On-going process of execution	Phase # 4

Tasks

Phase	Activity	Task	Sequence
Project initiation	Develop planning	Identify need for innovation. Document problem and solution (with team sessions).	1 st 2 nd T.N.

Project Planning	Develop Cost Analysis	Identify suitable equipment (and costs). Identify training requirements (and costs). Identify licensing requirements (and costs). Document feasibility study.	3 rd 4 th 5 th 6 th
Project execution	Develop procurement requirements	Identify payment terms and conditions for the drone technology, training and licensing/legal requirements. Draft procedure for approval and payment. Review and approve for implementation.	7 th 8 th

Effort

Task	Effort
Identify need for innovation. Document problem and solution (with team sessions).	5 days 5 days
Identify suitable equipment (and costs). Identify training requirements (and costs). Identify licensing requirements (and costs). Document feasibility study (including competitor landscape).	30 days 30 days 30 days 30 days
Identify payment terms and conditions for the drone technology, training and licensing/legal requirements. Draft procedure for approval and payment.	30 days
Review and approve for implementation.	90 days

Resources

Task	Resource
Identify need for innovation. Document problem and solution (with team sessions).	S Kay S Kay
Identify suitable equipment (and costs). Identify training requirements (and costs). Identify licensing requirements (and costs). Document feasibility study (including competitor landscape).	TBC TBC TBC TBC
Review and approve for implementation.	Directors

Project plan

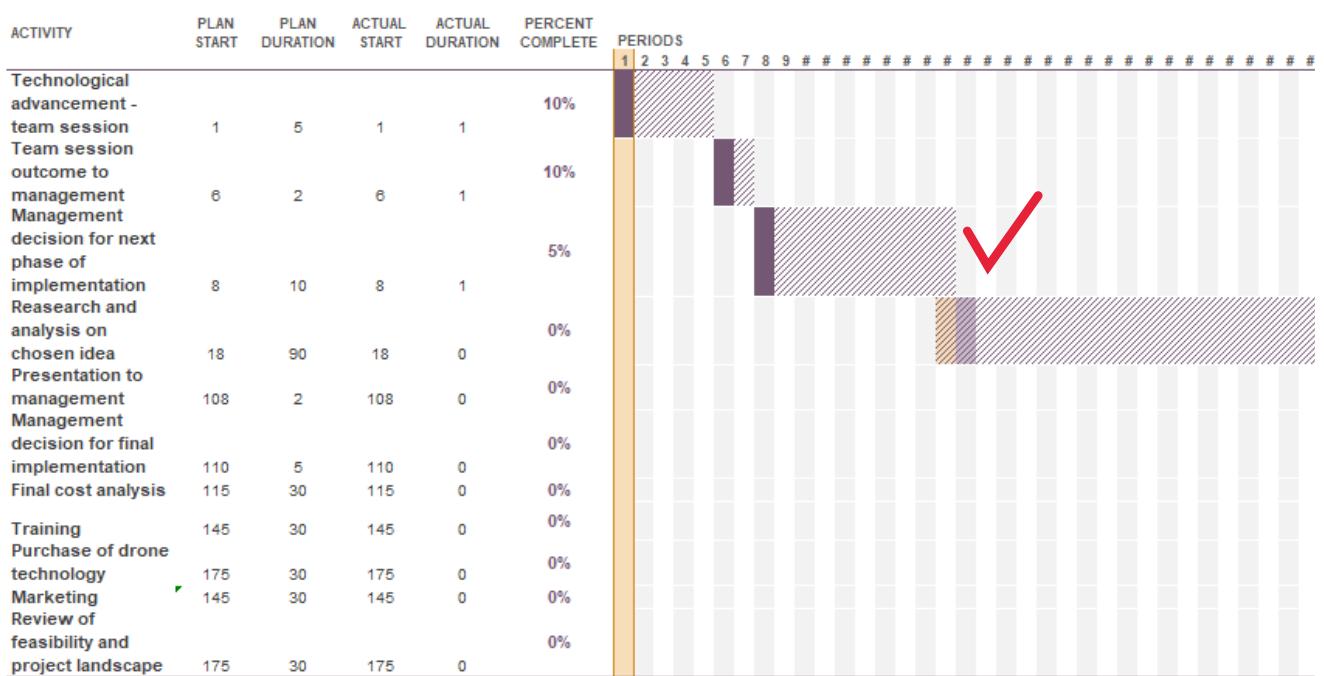
Schedule

Proposed schedule still to be aligned with on-going major project activities.

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Change management programme

Select a period to highlight at right. A legend describing the charting follows



Note: A full schedule to be provided after confirmation of current projects timelines.

Dependencies

‘Dependencies’ are logical relationships between phases, activities or tasks which influence the way that the project must be undertaken. Dependencies may be either internal to the project (e.g. between project activities) or external to the project (e.g. a dependency between a project activity and a business activity). There are four types of dependencies:

1. Finish-to-start (*the item this activity depends on must finish before this activity can start*)
 2. Finish-to-finish (*the item this activity depends on must finish before this activity can finish*)
 3. Start-to-start (*the item this activity depends on must start before this activity can start*)
 4. Start-to-finish (*the item this activity depends on must start before this activity can finish*).

Key project dependencies:

Activity	Depends on	Dependency Type
Training and Purchase of drone technology	Management decision for final implementation	Finish-to-start
Marketing	Management decision for final implementation	Finish-to-start
Management decision for final implementation	Presentation to management	Finish-to-start

Assumptions

It is assumed that:

- The research will be done within a year period with no significant changes to the drone technology industry.
- South African Aviation Legal requirements will not change significantly.
- The team/resources identified will be available upon request.
- Approved funding will be available upon request.

Constraints

Planning constraints:

- The project must operate within the approved funding and resource allocations.
- The project team must deliver the drone survey with no requirement for additional training or hardware (or software).
- Projects must show an improved time for deliverables as well as improved accuracy as indicated in the problem-solving document.

Budget, Risks and Change Management

Project Budget

Envisioned costs based on current pricing:

WBS	Task	Labor	Materials	Budget	Actual
1	Drone technology	-	R100,000.00	R150,000.00	TBC
2	Pilot training and licensing	R100,000.00	R100,000.00	R200,000.00	TBC
3	Salary increase (annually)	R200,000.00	-	R200,000.00	TBC
4	Maintenance (annually)	-	R15,000.00	R50,000.00	TBC
5	Software			R50,000.00	TBC

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Risk Log

ID	Risk	Impact	Response	Risk Level	Risk Owner
1	Trained employee resigns	Schedule and project deliverables	Backup Employee	High	TBC – unit manager
2	Outdated technology purchased	Project cost (if purchased drone becomes outdated then costs after purchase may reduce)	Ensure research on available technology is up to date	Medium	TBC – unit manager
3	Changes in legal requirements	Project deliverables and cost	Ensure research is up to date	Medium	TBC – unit manager
4	Existing customers refuse to pay for service	Cost implications	Market services to broader range of customers.	Medium	Directors

Change Management

Date Identified	Request	Impact	Approval	Date Started	Date Completed
27/07/2023	Implement drone technology	Project deliverables	Yes	27/07/2023	TBC

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Appendix

Available on request:

- Planning document.
- Problem-solving document.
- Various meeting minutes held with role players.
- Change request form.

CHANGE IS NEEDED TO ENSURE WE CONSTANTLY IMPROVE

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Change Request Form (**draft**)

SUBMITTER - GENERAL INFORMATION				
CR#	1			
Submitter Name	Sean Kay			
Brief Description of Request	Implementation of Drone Technology to enhance visual inspection offerings and improve market reach.			
Date Submitted	27/07/2023			
Date Required	27/08/2023			
Priority	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Medium	<input type="checkbox"/> High	<input type="checkbox"/> Mandatory
Reason for Change	Problem identified within visual assessment works and an Innovative solution to ultimately improve time spent on assessments and access full structure which will improve efficiency and accuracy of site work and reporting was found. Drone technology implementation.			
Other Artifacts Impacted				
Assumptions and Notes	High level analysis conducted, more detailed research and analysis is required before making final decision to implement.			
Attachments or References	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
	Hard copies available of planning and problem-solving documentation			

INITIAL ANALYSIS				
Hour Impact				
Duration Impact		1 year plan		
Schedule Impact				
Comments	On going research required to ensure latest most affordable drone solutions are sort. Research into training and licensing requirements also required to be done in detail.			
Recommendations	Assign responsible person to conduct internal and external research			

CHANGE CONTROL BOARD - DECISION				
Decision	<input type="checkbox"/> Approved	<input type="checkbox"/> Approved w/Conditions	<input type="checkbox"/> Rejected	<input checked="" type="checkbox"/> More Info
Decision Date	On going			
Decision Explanation	Final after 1 year final document is reviewed and accepted			
Conditions	Quarterly review			



TEAM MEETING MINUTES

Location: HQ
Date: 27/07/2023
Time: 09:00am
Facilitator: Sean Kay

Agenda items

1. Discussion on the outcome of the problem-solving team session with management.

Team identified an improvement needed in our visual assessment capabilities, several limitations regarding access and time spent on site. The solution is the use of drone technology. While we still need further research to understand all the financial implications, we feel this is a great idea to implement as it will only improve our already existing service and also allow us to venture into other surveying avenues later on.

Jacques: as we already subcontract the service out on major projects, this could be a good initiative to move us into gaining more business which will likely cover the costs involved. Please provide details of full cost analysis.

Sean: The full cost analysis will take a bit of time as there are many factors requiring further research – such as the legal and training requirements as well as the types of drones that will be best suited to us (we need to consult people in the drone industry – perhaps look at any marketing events we could attend).

2. Discussion on Implementation strategy (change management plan for use of drone technology) and proposed schedule/programme.

Sean: I proposed a 1-year plan to ensure sufficient time allowance to do a detailed analysis. This time frame can be adjusted to suit the current workload so as to ensure whomever we appoint is not under pressure.

Jacques: This should be sufficient, please let's discuss the appointment once the final plan is in place so as to ensure we have enough resources. With the next financial year end, we can discuss available funding and assess the viability of the implementation with all figures accounted for.

3. General thoughts

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The company is in a good space financially so we need to ensure the option will not be detrimental to our current workload and clientele. We look forward to the progress and are happy to monitor throughout the year.

Sean: Implementation of creative thinking initiatives would also be a great strategy to create an all-inclusive employee relationship, especially considering the problem-solving session. Next meeting – we can create some structure to accommodate these sessions and discuss if it needs to be a quarterly or bi-weekly session.

Action items	Owner(s)	Deadline	Status
Drafting problem solving document	Sean Kay	26/07/2023	Complete
Drafting of CMP	Sean Kay	27/07/2023	Complete
Review of CMP	Jacques Louw	26/08/2023	In progress
Review of CMP	Wynand Louw	26/08/2023	In progress

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