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Project Change Requests Control

System for the Analysis of Nanoparticles Micrographs

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3.2.1 Introduction

This document compiles all the requested modifications for this project, along with the policies governing the execution of change requests. It provides a comprehensive overview of both approved and rejected changes, including an analysis and decision form. Within this document, one can discern the reasons behind the approval or rejection of each project change.
Every change request is assigned a unique change request ID and includes details such as the requestor's identity, the specific items affected by the change request, and a description of the impact on various areas. Additionally, a SWOT (Strengths, Weaknesses, Opportunities, and Threats) table is utilized to assess the implications of the proposed changes. The final decision for each change request is thoroughly explained within the document.

3.2.2 Policy Rules

In order to ensure effective control and management of system application changes, it is essential to adhere to the following policies. These policies provide a structured framework for reviewing, authorizing, testing, implementing, and releasing changes in accordance with the software configuration management plan. By following these policies, we can maintain the integrity of the baseline project and ensure that changes are executed in a controlled and organized manner. This introduction sets the stage for a comprehensive approach to change management, emphasizing the importance of adherence to established procedures and guidelines throughout the change process.

3.2.2.1 Change Management Policy: Effective Planning and Risk Mitigation

The Change Management Policy aims to establish a structured process for managing changes within the system, with the primary objectives of effective planning and minimizing risks. This policy promotes communication and collaboration between staff members and clients to ensure a smooth transition during changes. Additionally, it emphasizes the importance of transparency and visibility throughout the change process. By implementing this policy, the organization seeks to mitigate the probability of errors or adverse impacts on the system. Through careful planning and clear guidelines, the Change Management Policy serves as a framework to facilitate successful changes while maintaining the stability and functionality of the system.

1. Establish a structured process for managing changes in the system to ensure effective planning and minimize risks.

2. Promote communication and collaboration between staff members and clients regarding changes.

3. Ensure transparency and visibility of changes in the system.

4. Mitigate the probability of errors or adverse impacts on the system.

3.2.2.2 Rules and Policies for Change Consideration

1. Only authorized personnel, such as project managers or department heads, are allowed to submit change requests.

2. Change requests must be clearly and accurately documented. If a request is incomplete or unclear, the change owner will be notified to provide the necessary information.

3. Changes proposed by specific departments must undergo evaluation or approval by relevant stakeholders, such as finance or quality assurance teams.

4. Changes with a high probability of significant failures or negative consequences will be carefully reviewed and may be rejected to minimize risks.

5. Changes that would cause delays exceeding a predetermined threshold will be carefully evaluated and may be rejected, unless they address critical issues or comply with regulatory requirements.

6. Changes that significantly increase the project's cost beyond an acceptable threshold will undergo thorough financial assessment and may be rejected or require additional approvals.

7. Changes that do not involve internal components of the system may not require approval from specific departments.

8. Change acceptance will be determined based on the consensus of relevant stakeholders, considering factors such as impact, feasibility, and strategic alignment.

9. Change requests for adding new features or functionalities will be evaluated based on the project timeline, ensuring sufficient time for proper development and testing.

10. Changes that have a substantial duration and may impact critical tasks or milestones will be carefully reviewed and may require additional considerations or alternative solutions.

3.2.2.3 Process for Submitting a Change Request

To propose a change, authorized personnel must prepare a formal document describing the change, its purpose, and the expected benefits. The change request should be submitted through the designated channel, following the defined process. The request will then undergo thorough review and evaluation by relevant stakeholders, considering factors such as technical feasibility, resource availability, and potential impacts.

3.2.2.4 Review of Change Requests

Change requests will be reviewed by a designated committee or team consisting of relevant stakeholders. The committee will assess the proposed changes based on their alignment with project goals, potential risks, resource requirements, and overall impact on the system. The committee's decision will determine whether the change request is approved, rejected, or requires further analysis or adjustments.

3.2.2.5 Approval and Implementation of Changes

Approved changes will be integrated into the system's development or improvement plan. The implementation process will adhere to established procedures, ensuring proper testing, documentation, and communication with relevant stakeholders. Changes will be monitored and evaluated to assess their effectiveness and address any potential issues or adjustments that may arise during implementation.

3.2.3 CR01 - Counting nanoparticles by shape and generating histograms by shape and size from micrographs

Description

The client has requested a new functionality for the system that allows users to count nanoparticles by shape in a micrograph and produce histograms by shape and size. The system must be able to identify nanoparticles by their shape, such as spherical, cylindrical, or irregular, and count them accordingly.

Table 3.2.1. SWOT change request Counting nanoparticles by shape and generating histograms by shape and size from micrographs

SWOT	
STRENGTHS (+)	WEAKNESSES (-)
• There are at least 10 different machine learning algorithms and techniques available with an accuracy rate of at least 80% that can be used to identify the shape of nanoparticles. • We already have a personal who has the skill to complete the CR.	• The implementation of the new functionality may require an additional 10% of resources and software licenses, which could increase the project's budget by $50,000 and timelines by 2 months. • The accuracy of the shape detection are going to depends on the quality input image.
OPPORTUNITIES (+)	THREATS (-)
• At least 80% of users and stakeholders have expressed their interest in this functionality, indicating a strong demand for the feature. • The platform can collaborate with scientists to improve the accuracy of the shape detection algorithm.	• Unexpected technical difficulties may arise during the implementation, which could significantly increase project costs by $30,000 and timelines by 6 months.. • The personal who can manage the new CR are involved in another project, may impact the timeline in those projects.

Criteria analysis

This is a criteria analysis list that evaluates a change request for the implementation of a new functionality in a system to count nanoparticles by shape and generate histograms by shape and size.

Table 3.2.2. Criteria change request Counting nanoparticles by shape and generating histograms by shape and size from micrographs

Criteria	Description
Analysis of Impact on Functionality	The change request will have a significant impact on the system's functionality, as it will allow for better analysis of nanoparticle data according to their shape and size. This will significantly improve the quality of the results obtained and enable better data interpretation.
Analysis of Technical Feasibility	The implementation of the functionality to count nanoparticles by shape and generate histograms by shape and size is technically feasible. There are several machine learning algorithms and techniques that can be used to identify the shape of nanoparticles and count them in micrographs. The implementation of the functionality will require image processing and analysis techniques, which should not pose any significant technical challenge.
Analysis of Impact on Budget and Timelines	The change request may have a moderate impact on the project's budget and timelines, as it may require investment in additional resources and software licenses for the implementation of the algorithms and the purchase of additional hardware if needed. It may also be necessary to extend the project timeline for the implementation and testing of the new functionality.
Analysis of Justification for the Change Request	The change request is justified, as it will significantly improve the system's results quality and provide a competitive advantage. Additionally, users and stakeholders have expressed their interest in this functionality to improve their experience in using the system.

Configuration items affected

This passage describes the different components of a microscopy image analysis system that will be affected by the implementation of the functionality to count nanoparticles by shape and generate histograms by shape and size. The Image Analysis Module, Image Processing Algorithms, Data Storage, and Reporting Module will all need to be modified to accommodate this new functionality. The modifications may include allowing for manual selection of the shape of nanoparticles, incorporating information about the nanoparticle shape into analysis algorithms, adding nanoparticle shape information to the data storage, and including more detailed information about the nanoparticle shape in analysis reports.

Table 3.2.3. Configuration items affected of change request Counting nanoparticles by shape and generating histograms by shape and size from micrographs.

Module	Description
Image Analysis Module:	The image analysis module will need to be modified to include the functionality to identify the shape of nanoparticles and count them accordingly. Additionally, an additional functionality may be considered to allow manual selection of the nanoparticle shape, in case automatic detection is not accurate or cannot be performed.
Image Processing Algorithms:	The algorithms used for image processing may also need to be modified to incorporate information about the shape of nanoparticles. This can improve the accuracy and quality of the results obtained by the system.
Data Storage:	The data storage may also need to be modified to include information about the shape of nanoparticles counted in each image. This would allow for better organization and retrieval of the data stored in the system.
Reporting Module:	The reports generated by the system may also be affected by the implementation of the functionality to count nanoparticles by shape and generate histograms by shape and size. It may be necessary to include more details about the nanoparticle shape and size in analysis reports.

Time

The implementation of this change request will take approximately 10 weeks and will consist of six phases. The first phase is the requirement analysis and project planning, which will take two weeks. The next two phases are the design and implementation of the nanoparticle counting module and the histogram generation module, respectively, which will each take two weeks. The fourth phase is the testing and debugging of the modules, which will take two weeks. The fifth phase is the database update, which will take one week. The final phase is documentation and delivery, which will take one week.

- **Week 1-2:** Requirement analysis and project planning. The project scope should be defined, the system elements that will be affected should be identified, and acceptance criteria should be defined.
- **Week 3-4:** Design and implementation of the nanoparticle counting module. The necessary algorithms for nanoparticle counting should be defined and this functionality should be implemented in the system.
- **Week 5-6:** Design and implementation of the histogram generation module. The necessary algorithms for histogram generation should be defined and this functionality should be implemented in the system.

- **Week 7-8:** Testing and debugging of the modules. A series of tests should be carried out to ensure that the modules work correctly and that the results obtained are accurate. Any problems identified during these tests should be addressed.
- **Week 9:** Update of the image database. The database will need to be updated to include information about nanoparticle shape and size.
- **Week 10:** Documentation and delivery. The system documentation should be updated and the system should be delivered to end-users.

Table 3.2.4. Schedule of change request Counting nanoparticles by shape and generating histograms by shape and size from micrographs

week							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Human Resources

The implementation of this change request will require additional personnel. The project will require a total of 3 full-time persons for 60 days. The Design team will consist of 1 person for 10 days, the Development team will consist of 2 persons for 40 days, and the Testing team will consist of 1 person for 10 days.

Design team: 1 full-time person for 10 days
Development team: 2 full-time persons for 40 days
Testing team: 1 full-time person for 10 days

Budget

Table 3.2.5. Budget of change request Counting nanoparticles by shape and generating histograms by shape and size from micrographs

Cost for the implementation of this change request	
Personnel salaries	**$30,000**
Hardware and software costs	**$5,000**
Testing	**$2,500**
Implementation	**$2,500**
Total	**$40,000**

The Personnel salaries category represents the cost of the salaries of the additional project team members. The Hardware and software costs category represents the cost of any necessary equipment or software licenses. The Testing costs category represents the cost of testing the project before deployment. The Implementation costs category represents the cost of deploying the project.

Conclusión

Based on the analysis of the change request, it appears that adding the requested functionality of counting nanoparticles by shape and producing histograms by shape and size could have a positive impact on the project. However, it's important to carefully consider the metrics of change complexity, change duration, and business impact, as well as the associated risks. While this change will require significant time and resources, if implemented correctly, it could improve the user experience and increase the overall efficiency of the system. Ultimately, a thorough evaluation of the potential benefits and risks should be conducted before making a final decision.

3.2.4 CR02 - Module for identification of nanostructures given a list of nanostructures

Description

The client has requested a module that allows the system to identify nanostructures in a list of nanostructures. The system will have to process the list of nanostructures and provide information on the identification of each nanostructure.

Table 3.2.6. SWOT of change request: Module for identification of nanostructures given a list of nanostructures

SWOT	
STRENGTHS (+)	WEAKNESSES (-)
• The module is estimated to improve the quality of the results by at least 30%. • The platform already has a report generation module that can be used to generate reports on the identified nanostructures.	• The implementation of the module may require an additional investment of $50,000 in processing and storage capacity. • The identification algorithm may not be entirely accurate, leading to false positives or false negatives in the results.
OPPORTUNITIES (+)	THREATS (-)
• The discovery of new nanostructures using the module is estimated to generate at least 10 new patents. • The platform can work with researchers and scientists to continually improve the accuracy and efficiency of the identification algorithm, providing a competitive advantage over other platforms.	• The implementation of the module is estimated to delay the project timeline by at least 3 months. • Unexpected technical difficulties may arise during the implementation, which could significantly increase project costs by $20,000.

Criteria analysis

This is a criteria analysis list that evaluates a change request for the implementation of a module for the identification of nanostructures given a list of nanostructures. The list includes an analysis of the impact on functionality, technical feasibility, impact on budget and timelines, and justification for the change request. It is used to assess whether the change request is necessary, justifiable, and feasible for implementation.

Table 3.2.7. Criteria table of change request: Module for identification of nanostructures given a list of nanostructures

Criteria	Description
Analysis of Impact on Functionality	The change request will have a significant impact on the system's functionality, as it will allow for better identification and analysis of nanostructures in a given list. This will significantly improve the quality of the results obtained and enable better data interpretation.
Analysis of Technical Feasibility	The implementation of the module for the identification of nanostructures given a list of nanostructures is technically feasible. There are algorithms and techniques that can be used to identify nanostructures based on specific features. However, it may require increased processing and storage capacity for the implementation of these algorithms. It is important to ensure that the system is capable of processing and storing the large amounts of data that are likely to be involved.
Analysis of Impact on Budget and Timelines	The change request may have a significant impact on the project's budget and timelines, as it may require greater investment in resources for the implementation of the module. It may also be necessary to extend the project timeline for the implementation and testing of the new functionality. The project manager should evaluate the cost-benefit analysis of the change request and weigh it against the project's constraints.
Analysis of Justification for the Change Request	The change request is justified, as it will significantly improve the system's results quality and provide a competitive advantage. Additionally, users and stakeholders have expressed their interest in this functionality to improve their experience in using the system.

Configuration items affected

This passage describes the different components of the system that will be affected by the implementation of the module for the identification of nanostructures given a list of nanostructures. The data processing module, data analysis algorithms, data storage, and data analysis reports will all need to be modified to accommodate this new functionality. The modifications may include incorporating information about the nanostructures into analysis algorithms, adding nanostructure information to the data storage, and including more detailed information about the nanostructures in analysis reports.

Table 3.2.8. Configuration items affected table of change request: Module for identification of nanostructures given a list of nanostructures

Module	Description
Data Processing Module:	The data processing module will need to be modified to include the functionality of identification of nanostructures given a list of nanostructures. The module will have to be able to process the data and identify each nanostructure in the list.
Data Analysis Algorithms:	The algorithms used for data analysis may also need to be modified to incorporate information about the nanostructures. This can improve the accuracy and quality of the results obtained by the system.
Data Storage:	The data storage may also need to be modified to include information about the identified nanostructures. This would allow for better organization and retrieval of the data stored in the system.
Data Analysis Reports::	The reports generated by the system may also be affected by the implementation of the module for the identification of nanostructures given a list of nanostructures. It may be necessary to include more details about the identified nanostructures and how they were identified.

Time

This 10-week schedule implements a new module for identification of nanostructures in a software system. It includes four phases, each taking two weeks. The phases are requirement analysis, design and implementation of the module, integration with existing system functionality, and testing and debugging. The system will be delivered to end-users in week 10 after updating system documentation.

- **Week 1-2:** Requirement analysis and project planning. The project scope should be defined, the system elements that will be affected should be identified, and acceptance criteria should be defined.
- **Week 3-4:** Design and implementation of the module. The necessary algorithms for identification of nanostructures should be defined and this functionality should be implemented in the system.
- **Week 5-6:** Integration with existing system functionality. The module will need to be integrated with the existing system functionality to ensure it works seamlessly with the system.

- **Week 7-8:** Testing and debugging. A series of tests should be carried out to ensure that the module works correctly and that the results obtained are accurate. Any problems identified during these tests should be addressed.
- **Week 9-10:** Documentation and delivery. The system documentation should be updated and the system should be delivered to end-users.

Table 3.2.9. Schedule of change request: Module for identification of nanostructures given a list of nanostructures

week									
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Human resources

This list provides an overview of the human resources required for a specific project. The project is broken down into four teams: Analysis, Design and Implementation, Development, and Testing. The Analysis team consists of one person who will work for four days, the Design and Implementation team consists of one person who will work for five days, the Development team consists of two people who will work for 30 days, and the Testing team consists of one person who will work for 10 days. These teams are composed of full-time personnel who will work on the project for the duration specified.

- **Analysis team:** 1 full-time person for 4 days
- **Design and Implementation team**: 1 full-time person for 5 days
- **Development team**: 2 full-time persons for 30 days
- **Testing team**: 1 full-time person for 10 days

Budget

This table outlines the budget for a project, with a total cost of The budget is broken down into several categories

Table 3.2.10. Budget of Module of change request: identification of nanostructures given a list of nanostructures

Cost for the implementation of this change request	
Personnel salaries	**$40,000**
Hardware and software costs	**$5,000**
Testing	**$5,000**
Implementation	**$5,000**
Total	**$55,000.0**

The Hardware and software costs category represents the cost of any necessary equipment or software licenses. The Testing costs category represents the cost of testing the project before deployment. The Implementation costs category represents the cost of deploying the project. The Contingency budget represents a reserve fund that can be used to cover unexpected expenses that may arise during the project.

Conclusión

Based on the analysis, the proposed change request of adding a module for identification of nanostructures would require significant time and resources, but it could have a positive impact on the overall project by improving the user experience and increasing efficiency. However, we should carefully evaluate the risks associated with this change, especially if the complexity and duration of the change are high.

3.2.5 CR03 - Eliciting compound from micrograph structure

Description

The client requests that the compound be elicited from the structure discovered at the micrograph.

Table 3.2.11. SWOT of change request: Eliciting compound from micrograph structure

SWOT	
STRENGTHS (+)	WEAKNESSES (-)
• ımplementing compound elicitation from micrograph structures will reduce analysis time by 30% and increase result accuracy by 20%. • The feature could potentially attract new users who require compound identification. • The software already has a solid foundation in image analysis, which can be leveraged for compound identification.	• The increased processing and storage capacity required for the new functionality may result in a $25,000 increase in project budget. • It may be difficult to accurately identify compounds from micrographs, as there can be a wide range of potential compounds present.
OPPORTUNITIES (+)	THREATS (-)
• The implementation of the new functionality may lead to new research collaborations and grants, resulting in a 10% increase in funding opportunities due to the new discoveries and insights. • The new functionality could potentially open up new revenue streams, such as offering premium services for advanced compound identification.	• The new functionality not meeting the expectations of users and stakeholders may result in a 10% decrease in user satisfaction and revenue. • Unexpected technical difficulties may arise during the implementation, which could significantly increase project costs by $30,000 and timelines by 4 months.

Criteria analysis

This is a criteria analysis list that evaluates a change request for the eliciting compound from the structure discovered at the micrograph. The list includes an analysis of the impact on functionality, technical feasibility, impact on budget and timelines, and justification for the change request. It is used to assess whether the change request is necessary, justifiable, and feasible for implementation.

Table 3.2.12. Criteria table of change request: Eliciting compound from micrograph structure

Criteria	Description
Analysis of Impact on Functionality	The change request will have a significant impact on the system's functionality, as it will allow for the identification of the compound from the structure discovered at the micrograph. This will significantly improve the quality of the results obtained and enable better data interpretation.
Analysis of Technical Feasibility	The implementation of eliciting the compound from the structure discovered at the micrograph is technically feasible. There are algorithms and machine learning techniques that can be used to identify the compound from the micrograph structure. However, it may require increased processing and storage capacity for the implementation of these algorithms.
Analysis of Impact on Budget and Timelines	The change request is justified, as it will significantly improve the system's results quality and provide a competitive advantage. Additionally, users and stakeholders have expressed their interest in this functionality to improve their experience in using the system
Analysis of Justification for the Change Request	The change request is justified, as it will significantly improve the system's results quality and provide a competitive advantage. Additionally, users and stakeholders have expressed their interest in this functionality to improve their experience in using the system.

Configuration items affected

This passage describes the different components of a microscopy image analysis system that will be affected by the implementation of eliciting the compound from the structure discovered at the micrograph. The Image Analysis Algorithms, Image Database, and Image Analysis Reports will all need to be modified to accommodate this new functionality. The modifications may include allowing for manual selection of the compound type, incorporating information about the compound type into analysis algorithms, adding compound type information to the image database, and including more detailed information about the compound type in analysis reports.

Table 3.2.13. Configuration items affected of change request: Eliciting compound from micrograph structure

Module	Description
Image Analysis Algorithms:	The algorithms used for image analysis may need to be modified to incorporate information about the type of compound. This can improve the accuracy and quality of the results obtained by the system.
Image Database:	The image database may need to be modified to include information about the type of compound for each image. This would allow for better organization and retrieval of the images stored in the system.
Image Analysis Reports:	The reports generated by the system may also be affected by the implementation of the eliciting compound from the structure discovered at the micrograph. It may be necessary to include more details about the type of compound and how it was identified.

Time

This 4-week schedule implements a new feature in a compound discovery software system. It includes four phases, each taking one week. The phases are requirement analysis, design and implementation of the elicitation module, testing and debugging, and deployment. The system will be delivered to end-users in week 4 after updating system documentation.

- **Week 1:** Requirement analysis and project planning. The project scope should be defined, the system elements that will be affected should be identified, and acceptance criteria should be defined.
- **Week 2**: Design and implementation of the elicitation module. The necessary algorithms for eliciting the compound from the micrograph structure should be defined and this functionality should be implemented in the compound discovery module.
- **Week 3:** Testing and debugging. A series of tests should be carried out to ensure that the system works correctly and that the results obtained are accurate. Any problems identified during these tests should be addressed.
- **Week 4:** Documentation and delivery. The system documentation should be updated and the system should be delivered to end-users.

Table 3.2.14. Schedule of change request: Eliciting compound from micrograph structure

week			
1	**2**	**3**	**4**

Human resources

This list provides an overview of the human resources required for this project. The project will require one full-time software engineer for four weeks to design and implement the elicitation module, one full-time software tester for one week to test and debug the system, and one full-time technical writer for one week to update the system documentation.

- **Software engineer:** 1 full-time person for 4 weeks
- **Software tester:** 1 full-time person for 1 week
- **Technical writer:** 1 full-time person for 1 week

Budget

This table outlines the budget for this project, with a total cost of. The budget is broken down into several categories.

Table 3.2.15. Budget of change request: Eliciting compound from micrograph structure

Cost for the implementation of this change request	
Personnel salaries	**$35,000**
Hardware and software costs	**$5,000**
Testing	**$5,000**
Implementation	**$5,000**
Total	**$50,000**

The Personnel salaries category represents the cost of the salaries of the project team members. The Hardware and software costs category represents the cost of any necessary equipment or software licenses. The Testing costs category represents the cost of testing the project before deployment. The Implementation costs category represents the cost of deploying the project. The Contingency budget represents a reserve fund that can be used to cover unexpected expenses that may arise during the project.

Conclusión

The impact on functionality of the software will be positive since the elicitation of the compound from the micrograph structure is a valuable feature that can improve the quality of the results. The technical feasibility of the change request needs to be evaluated to ensure that the system can handle the new functionality without negatively impacting the performance. The impact on budget and timelines should also be considered, but since the project is relatively small and the budget is reasonable, it should not be a significant concern. Justification for the change request needs to be evaluated by discussing with stakeholders and users to understand their needs and expectations.

3.2.6 CR04 - Detailed report generation of software use for experiments involving nanotechnology

Description

This change request involves generating a detailed report on the use of software for experiments involving nanotechnology. The report should include experiments performed and the number of users weekly, and non-compliance with this new law can lead to economic sanctions to the company using the system.

Table 3.2.16. SWOT of change request: Detailed report generation of software use for experiments involving nanotechnology

SWOT	
STRENGTHS (+)	WEAKNESSES (-)
• The detailed report will enable the company to comply with legal requirements and avoid economic sanctions. • Generating reports will enable the company to have improved software use control and facilitate identification of software issues. • Report history module for easy access to past reports.	• The change request may require significant development effort and may have a moderate impact on the project's budget and timelines. Estimated cost: $30,000 and 2 months delay.
OPPORTUNITIES (+)	THREATS (-)
• The new functionalities implemented for generating the report may be useful for other types of reports or analysis. • The company can expand its platform to include additional features that can meet the needs of researchers in the field of nanotechnology.	• Failure to comply with the new law can result in economic sanctions and damage the company's reputation. • The cost and effort required to implement the change request may discourage the company from pursuing other similar projects in the future. Potential loss: $50,000 in revenue and future opportunities.

Criteria analysis

The following is a criteria analysis list that evaluates a change request for the generation of a detailed report on software use for experiments involving nanotechnology. The list includes an analysis of the impact on functionality, technical feasibility, impact on budget and timelines, and justification for the change request. This analysis will assess whether the change request is necessary, justifiable, and feasible for implementation.

Table 3.2.17. Criteria table of change request: Detailed report generation of software use for experiments involving nanotechnology

Criteria	Description
Analysis of Impact on Functionality	The change request will not have a direct impact on the functionality of the system. However, it may require the addition of new functionalities to collect and report the required data. These new functionalities may have a minor impact on the overall functionality of the system.
Analysis of Technical Feasibility	The implementation of the required functionalities to generate the detailed report is technically feasible. However, it may require significant development effort to collect and report the required data. Additionally, the new functionalities may require additional storage capacity to store the data generated.
Analysis of Impact on Budget and Timelines	The change request may have a moderate impact on the project's budget and timelines, as it may require significant development effort to implement the required functionalities. It may also require the acquisition of additional storage capacity to store the generated data. Moreover, the new functionalities will need to be tested to ensure their accuracy and correctness, which may lead to the extension of the project timeline.
Analysis of Justification for the Change Request	The change request is justified, as it is a legal requirement for companies to report the use of software for experiments involving nanotechnology. Additionally, the report generation will allow the company to have better control over the software use and may help in identifying issues with the software that need to be addressed.

Configuration items affected

This passage describes the different components of the system that will be affected by the implementation of the required functionalities for generating the detailed report on software use for experiments involving nanotechnology. The data collection module, data storage module, and reporting module will need to be modified to accommodate this new functionality. The modifications may include adding new data collection fields, implementing data storage procedures, and developing new reporting templates.

Table 3.2.18. Configuration items affected table of change request: Detailed report generation of software use for experiments involving nanotechnology

Module	Description
Data Collection Module	The data collection module will need to be modified to include new fields to collect the required data. The new fields may include the experiments performed, the number of users weekly, and other relevant data.
Data Storage Module	The data storage module may need to be modified to accommodate the additional data generated by the new functionalities. It may also require additional storage capacity to store the generated data.
Reporting Module	The reporting module will need to be modified to generate the required report on software use for experiments involving nanotechnology. The report may include information about the experiments performed, the number of users weekly, and other relevant data.

Time

This change request will require a 10-week schedule to implement the requested report functionality. The schedule includes five phases, each taking two weeks, except for the last phase, which takes one week. The phases are requirement analysis, design, implementation, testing and debugging, and documentation. The system will be delivered to end-users in week 10 after updating system documentation.

- **Week 1-2:** Requirement analysis and project planning. The project scope should be defined, the system elements that will be affected should be identified, and acceptance criteria should be defined.
- **Week 3-4:** Design of the report. The necessary fields and information required in the report should be defined and the report layout and design should be created.
- **Week 5-6:** Implementation of the report functionality. The report generation module should be implemented and integrated with the system.
- **Week 7-8:** Testing and debugging of the report. A series of tests should be carried out to ensure that the report is generated correctly and that the results obtained are accurate. Any problems identified during these tests should be addressed.
- **Week 9:** Documentation. The system documentation should be updated to reflect the changes and include instructions for generating the report.
- **Week 10:** Delivery. The updated system should be delivered to end-users.

Table 3.2.19. Schedule of change request: Detailed report generation of software use for experiments involving nanotechnology

week									
1	2	3	4	5	6	7	8	9	10

Human resources

This list provides an overview of the human resources required for the project. The project is broken down into four teams: Analysis, Design, Development and Testing. The Analysis team consists of one person who will work for four days, the Design team consists of one person who will work for five days, the Development team consists of two people who will work for 30 days, and the Testing team consists of one person who will work for 10 days. These teams are composed of full-time personnel who will work on the project for the duration specified.

- **Analysis team:** 1 full-time person for 4 days
- **Design team:** 1 full-time person for 5 days
- **Development team:** 2 full-time persons for 30 days
- **Testing team:** 1 full-time person for 10 days

Budget

This table outlines the budget for the project, with a total cost of $50,000. The budget is broken down into several categories:

Table 3.2.20. Budget of change request: Detailed report generation of software use for experiments involving nanotechnology

Cost for the implementation of this change request	
Personnel salaries	**$40,000**
Hardware and software costs	**$5,000**
Testing	**$3,000**
Documentation	**$2,000**
Total	**$50,000**

The Personnel salaries category represents the cost of the salaries of the project team members. The Software costs category represents the cost of any necessary software licenses. The Testing costs category represents the cost of testing the report functionality before deployment. The Documentation costs category represents the cost of updating the system documentation to include instructions for generating the report.

Conclusión

The impact of this change request is mainly negative for the company. The implementation of the detailed report functionality requires significant time and resources, and failure to comply with the new law could result in economic sanctions for the company. However, implementing this functionality would ensure compliance with the new law and avoid potential legal and financial consequences.

3.2.7 CR05 - Reports using JSON and RDF schema, with government server timestamp acknowledgment and storage in the system

Description

The reports generated by the system will use both JSON and RDF schema. The government server will acknowledge the reports with a timestamp and store them in the system.

Table 3.2.21. SWOT of change request: Reports using JSON and RDF schema, with government server timestamp acknowledgment and storage in the system

SWOT	
STRENGTHS (+)	WEAKNESSES (-)
• The use of both json and RDF is a good practice for system interoperability and transfer of structured data. • The ability to store reports within the system will allow for easy retrieval.	• May require an additional budget of $15,000 for resources and effort to implement and integrate into the system. • May have a moderate impact on the project's timeline, taking 4 weeks to complete.
OPPORTUNITIES (+)	THREATS (-)
• Provides an opportunity to establish an interface with the government server for data exchange. • There may be an opportunity for the platform to provide a report tracking function that allows users to see the status and progress of their reports.	• Lack of technical expertise and experience to implement the json and RDF requirements may delay the project and increase costs by $40,000 and timelines by 4 months • Failure to meet the government's requirements may result in penalties or regulatory consequences.

Criteria analysis

This change request will have a significant impact on the system's reporting functionality. Here is an analysis of its impact on functionality, technical feasibility, impact on budget and timelines, and justification for the change request:

Table 3.2.22. Criteria of Reports of change request: using JSON and RDF schema, with government server timestamp acknowledgment and storage in the system

Criteria	Description
Analysis of Impact on Functionality	The change request will significantly enhance the reporting functionality of the system by allowing for better organization, interoperability, and compatibility of the generated reports with external systems. The addition of a government server timestamp will provide a higher level of accountability, and the storage of the reports in the system will improve access and retrieval of information.
Analysis of Technical Feasibility	The implementation of JSON and RDF schema in the reporting functionality is technically feasible. There are tools and libraries available that can assist in generating reports with these formats. However, it may require additional resources and effort to implement and integrate these functionalities into the system.
Analysis of Impact on Budget and Timelines	The change request may have a moderate impact on the project's budget and timelines, as it may require additional resources for the development and testing of the new functionality. The timeline for the implementation of the change request may also need to be adjusted to ensure the quality of the new functionality.
Analysis of Justification for the Change Request	The change request is necessary and justifiable as it provides better interoperability and compatibility of the reports with external systems, thus improving the system's usefulness for users. The government server timestamp and report storage will also provide better accountability and accessibility, which are crucial for regulatory compliance and audit trails.

Configuration items affected

The following configuration items will be affected by the implementation of the change request:

Table 3.2.23. Configuration items affected of change request: Reports using JSON and RDF schema, with government server timestamp acknowledgment and storage in the system

Module	Description
Report generation module	The report generation module will need to be modified to include the JSON and RDF schema formats for the generated reports.
Report database:	The report database will need to be modified to accommodate the new formats and storage of reports.
Government server interface	An interface will need to be established with the government server to provide the necessary timestamp acknowledgment and storage of the reports.

Time

This change request aims to modify the report generation module of the system to meet the government's requirements for data exchange. The implementation of this feature will take 4 weeks, with the following phases: requirement analysis, implementation of JSON and RDF schema, report modification, and testing and debugging.

- **Week 1:** Requirement analysis and project planning. The project scope should be defined, the system elements that will be affected should be identified, and acceptance criteria should be defined.
- **Week 2:** Implementation of JSON and RDF schema. The report generation module should be modified to generate reports in both JSON and RDF schema. The timestamp provided by the government server should be added to the reports.
- **Week 3:** Modification of reports. The reports generated by the system will need to be adjusted to include the required JSON and RDF schema.
- **Week 4:** Testing and debugging. A series of tests should be carried out to ensure that the system works correctly and that the reports generated meet the government's requirements. Any problems identified during these tests should be addressed. Documentation and delivery should be completed in this week.

Table 3.2.24. Schedule of change request: Reports using JSON and RDF schema, with government server timestamp acknowledgment and storage in the system

week			
1	2	3	4

Human Resources

This modification will require one full-time developer who will work for 20 days. The developer should be experienced in JSON and RDF schema and should have experience in report generation.

Budget

The budget for this change request is estimated at $15,000. The budget includes Personnel salaries at $10,000, Hardware and software costs at $2,000, Testing costs at $2,000, and Documentation and delivery costs at $1,000.

Cost for the implementation of this change request	
Personnel salaries	**$10,000**
Hardware and software costs	**$2,000**
Testing	**$2,000**
Documentation	**$1,000**
Total	**$15,000**

Table 3.2.25. Budget of change request: Reports using JSON and RDF schema, with government server timestamp acknowledgment and storage in the system

Conclusión

The implementation of this feature is necessary to meet the government's requirements for data exchange. The impact of this change on the project is low, and the complexity and duration of the change are also low. The change will significantly improve the system's interoperability and compliance with government regulations. The budget and human resources required for this change request are reasonable and can be easily accommodated within the project's overall budget and timeline. Therefore, it is recommended to approve this change request.

3.2.7 CR06 - Implementation of Cryptographic Module for Transactions with Government Server

Description

This change request proposes implementing a cryptographic module to ensure secure transactions with the government server. The previous requirement of non-interaction with other systems is no longer possible.

Table 3.2.26. SWOT of change request: Implementation of Cryptographic Module for Transactions with Government Server

SWOT	
STRENGTHS (+)	WEAKNESSES (-)
• The implementation of the cryptographic module will ensure transaction security. • The inclusion of the cryptographic module may enhance the company's reputation. • Expected to reduce the risk of security breaches by 80%.	• May have a moderate impact on the project's budget and timelines: Estimated cost of $35,000. • Changes to the platform's structure can result in downtime and errors.
OPPORTUNITIES (+)	THREATS (-)
• Integration with other systems can increase platform functionality 10%. • Interaction with other systems can attract more users to the platform.	• Incorrect implementation of the cryptographic module can compromise the platform's security and user privacy. • Inability to interact with other systems may limit the platform's utility.

Criteria analysis

This is a criteria analysis list that evaluates a change request for the implementation of a cryptographic module for secure transactions with the government server. The list includes an analysis of the impact on functionality, technical feasibility, impact on budget and timelines, and justification for the change request. It is used to assess whether the change request is necessary, justifiable, and feasible for implementation.

Table 3.2.27. Criteria table of change request: Implementation of Cryptographic Module for Transactions with Government Server

Criteria	Description
Analysis of Impact on Functionality	The change request will have a positive impact on the system's functionality, as it will enhance the security of transactions with the government server. The cryptographic module will ensure secure data exchange and prevent unauthorized access or tampering of sensitive information.
Analysis of Technical Feasibility	The implementation of the required functionalities to generate the detailed report is technically feasible. However, it may require significant development effort to collect and report the required data. Additionally, the new functionalities may require additional storage capacity to store the data generated.
Analysis of Impact on Budget and Timelines	The change request may have a moderate impact on the project's budget and timelines, as it may require additional investment in resources for the development and integration of the cryptographic module. The timeline for testing and deployment may also need to be extended to ensure the proper functioning of the module.
Analysis of Justification for the Change Request	The change request is justified, as it is necessary to ensure secure transactions with the government server. Compliance with government regulations and security requirements is critical for the system's success and user trust.

Configuration items affected

This passage describes the different components of the nanoparticle analysis and detection system that will be affected by the implementation of a cryptographic module for secure transactions with the government server.

Table 3.2.28. Configuration items affected table of change request: Implementation of Cryptographic Module for Transactions with Government Server

Module	Description
User Registration Module	The user registration module may need to be modified to include additional security measures such as two-factor authentication to ensure secure user registration.
Login Module	The login module will need to be modified to include encryption of login credentials to ensure secure access to the system.
Report Generation Module	The report generation module will need to be modified to ensure secure transmission of generated reports to the government server.
User and Report Databases	The user and report databases may need to be modified to ensure secure storage of user and report information. This may include encryption of sensitive information and access control measures to prevent unauthorized access.

Time

This change request involves the implementation of a cryptographic module for transactions with the government server. The estimated time required for this change is 6 weeks. The phases involved are requirement analysis, design and implementation of the cryptographic module, testing, and deployment.

- **Week 1-2:** Requirement analysis and project planning. The project scope should be defined, the system elements that will be affected should be identified, and acceptance criteria should be defined.
- **Week 3-4:** Design and implementation of the cryptographic module. The necessary cryptographic algorithms should be defined and implemented to ensure secure transactions with the government server.
- **Week 5**: Testing. A series of tests should be carried out to ensure that the cryptographic module works correctly and that the transactions with the government server are secure.
- **Week 6:** Deployment. The system should be deployed to end-users.

Table 3.2.29. Schedule of change request: Implementation of Cryptographic Module for Transactions with Government Server

week					
1	**2**	**3**	**4**	**5**	**6**

Human resources

This change request requires the involvement of the Development team, consisting of two full-time persons for 30 days.

Development team: 2 full-time persons for 30 days

Budget

This table outlines the budget for the change request, with a total cost of $35,000. The budget is broken down into several categories, including Personnel salaries at $20,000, Hardware and software costs at $5,000, Testing costs at $5,000, Implementation costs at $5,000, and a Contingency budget of $0.

Table 3.2.30. Budget of change request: Implementation of Cryptographic Module for Transactions with Government Server

Cost for the implementation of this change request	
Personnel salaries	**$20,0000**
Hardware and software costs	**$5,000**
Testing	**$5,000**
Implementation	**$5,000**
Total	**$35,000**

Conclusión

Implementing a cryptographic module for transactions with the government server is essential to ensure secure communication and data transfer. The duration of this change is relatively short, and the budget required is reasonable. The impact of this change request is positive, as it ensures the security of the system and the confidentiality of the data transmitted. The risk associated with this change is low, as it is a standard security measure that is widely used in similar systems. Therefore, it is recommended to proceed with this change request.

3.2.8 CR07 - Increase support users from 30 to 250 users

Description

The client has requested an increase in the number of support users from 30 to 250 users due to a business opportunity.

Table 3.2.31. SWOT of change request: Increase support users from 30 to 250 users

SWOT	
STRENGTHS (+)	WEAKNESSES (-)
• Increase in the number of support users will lead to a significant improvement in the quality and speed of customer support. • The increase in the number of support users will enable the client to capitalize on a business opportunity and generate an estimated additional revenue of $50,000.	• The change request may have a significant impact on the project's budget and timelines, as it may require an additional budget of $20,000 and extend the project timeline by 4 weeks. • Failure to upgrade the necessary hardware and software to support the increase in the number of support users may result in performance issues, leading to a potential revenue loss of $10,000.
OPPORTUNITIES (+)	THREATS (-)
• By meeting the client's request, the company could gain access to new business opportunities and partnerships. • The increased capacity could allow the company to expand its support services to more clients, leading to increased revenue and market share.	• The project's budget and timelines may be impacted negatively, leading to an estimated loss of $40,000 in revenue. • The implementation of such a significant change could lead to technical issues, data loss, or other disruptions that could negatively impact the company's operations and profitability.

Criteria analysis

This is a criteria analysis list that evaluates a change request to increase the number of support users from 30 to 250 users in a nanoparticle analysis software platform. The list includes an analysis of the impact on functionality, technical feasibility, impact on budget and timelines, and justification for the change request. It is used to assess whether the change request is necessary, justifiable, and feasible for implementation.

Table 3.2.31. Criteria table of change request: Increase support users from 30 to 250 users

Criteria	Description
Analysis of Impact on Functionality	The change request will have a minimal impact on the functionality of the system since it only involves increasing the number of support users. The existing modules and configuration items will remain unchanged.
Analysis of Technical Feasibility	The implementation of the change request is technically feasible, as the system should be able to handle the increased number of support users without significant changes.
Analysis of Impact on Budget and Timelines	The change request may have a significant impact on the project's budget and timelines, as it may require additional resources to support the increased number of users. It may be necessary to hire additional support staff or upgrade the hardware and software infrastructure to accommodate the increase in users. However, the impact on the budget and timelines should be less significant than if there were changes to the existing modules or configuration items.
Analysis of Justification for the Change Request	The change request is justified, as it is driven by a business opportunity that requires additional support users to be added to the system. The increase in the number of support users will enable the client to capitalize on the business opportunity and generate additional revenue.

Configuration items affected

The change request does not require modifications to the existing modules or configuration items, so no items will be affected. The only changes required will be to add new support users to the system.

Time

The estimated time required to implement this change is four weeks, broken down into two phases. The first phase is the analysis and planning phase, which will take two weeks, and the second phase is the implementation and testing phase, which will take two weeks. The system will be delivered to end-users in week four after updating system documentation.

- **Week 1-2:** Analysis and planning phase. In this phase, the project scope should be defined, and the system elements that will be affected should be identified. The technical feasibility of the change should be assessed, and the project plan should be developed.
- **Week 3-4:** Implementation and testing phase. In this phase, the necessary changes to the system should be implemented to increase the performance of support users. Testing should be carried out to ensure that the system works correctly, and any problems identified during testing should be addressed.

Table 3.2.32. Schedule of change request: Increase support users from 30 to 250 users

week			
1	**2**	**3**	**4**

Human resources

This change request requires a team of three full-time developers to work for four weeks. The team will be composed of one lead developer and two supporting developers.

- **Lead developer:** 1 full-time person for 4 weeks
- **Supporting developers**: 2 full-time persons for 4 weeks

Budget

This change request will require a budget of $40,000. The budget is broken down into several categories, including Personnel salaries at $30,000, Hardware and software costs at $5,000, Testing costs at $3,000, Implementation costs at $1,000, and a Contingency budget of $1,000.

Table 3.2.33. Budget of change request: Increase support users from 30 to 250 users

Cost for the implementation of this change request	
Personnel salaries	**$30,000**
Hardware and software costs	**$5,000**
Testing	**$3,000**
Implementation	**$1,000**
Total	**$40,000**

Conclusión

Increasing the performance of support users from 30 to 250 users is a significant change that would require a significant amount of time and resources. However, it is a feasible change that can be implemented within a reasonable time frame and budget. The impact of this change on the project overall is positive, as it would improve the user experience and increase the efficiency of the system for support users.

3.2.9 Risk criteria

3.2.9.1 Budget

Table 3.2.33. Budget

Budget	
Impact	**Description**
High	Greater than 20%
Medium	Between 10% and 20%
Low	Less than 10%

3.2.9.2 Time

Table 3.2.34. Time

Time	
Impact	**Description**
High	Greater than 8 weeks
Medium	Between 6 weeks and 8 weeks
Low	Less than 6 weeks

3.2.9.3 Human resource

Table 3.2.35. Human resource

HR		
Impact	**Description**	**Description**
High	Hire more than 4 people	Move more than 2 people that already are in the compay
Medium	Hire 3 people	Move 1 person that already is in the company
Low	Hire less than 2 people	The people are already in the project

3.2.9.4 Effort

Table 3.2.36. Effort

Effort	
Impact	**Description**
High	More than 4 CI are affected
Medium	3 CI are affected
Low	Less than 2 CI are affected

3.2.9 Change request risk analysis

Table 3.2.37. Change request risk analysis

CR	BUDGET	TIME	HR	PRIORITY	EFFORT	KNOWLEDGE	MANDATORY BY LAW	RISK	IMPLEMENTED
CR01	Medium	High	High	**#5**	Medium	No	No	High	No
CR02	Low	High	High	**#6**	High	No	No	Low	No
CR03	High	Low	Medium	**#4**	Low	Yes	No	Low	No
CR04	High	High	High	**#1**	Medium	Yes	Yes	High	Yes
CR05	Low	Low	Low	**#2**	Medium	Yes	Yes	Medium	Yes
CR06	Medium	Medium	High	**#3**	High	Yes	Yes	Low	Yes