

Evaluating the Decision to Implement Fully Automated Testing to Increase Business Quality Service in Asuransi Astra Digital Products

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Abstract

Taking the product development cycle into account, this research will focus on the aim of assessing the ability of Asuransi Astra's digital teams to implement a fully automated testing process for its digital products. The author used qualitative and quantitative data and then processed the business solution using the AHP method and RACI Matrix. By analyzing various factors that can influence the successful implementation of automated testing, this research provides insights into determining which features must be prioritized to be tested by automation within Asuransi Astra's digital products. It is also supported by a model that facilitates understanding of role expectations and aligned team efforts, allowing for a more synchronized approach towards automation test teamwork and strategy.

Keywords: asuransi astra digital products; automated testing implementation; team alignment strategy

Received: 25 November 2023

Revised: 10 January 2024

Accepted: 17 January 2024

1. Introduction

The insurance sector, a vital player in the world's financial landscape, plays an instrumental role in mitigating risk and facilitating long-term investment capital. According to data from International business machines corporation (IBM), in 2020, global insurance premiums stood at \$6.3 trillion, which made insurance isn't just about transactions (Bauer, et al., 2021). At its best, it's about trust. In comparison, Indonesia's insurance sector observed a rise in the gross premium income, which reached IDR 503.3 trillion in 2020, marking a 4.6% increase from the previous year (OJK, 2021).

While the insurance industry has been historically slower to incorporate new technologies, the rise of InsurTech has catalyzed significant change. Aiming to disrupt traditional insurance models, the global InsurTech sector is projected to grow by 43.0% CAGR from 2021 to 2028, culminating at \$146.7 billion ("Insurtech Market Size | Industry Report, 2023-2030," 2022). Meanwhile, the InsurTech industry in Indonesia has made significant strides, driven by factors such as a growing middle class, increased smartphone usage, and supportive governmental regulations. It is projected to experience substantial growth by 2025.

In this changing landscape, Asuransi Astra stands out. From its inception, Asuransi Astra has consistently prioritized superior service and innovative insurance solutions. Throughout the COVID-19 period, the company swiftly developed and launched several products to cover pandemic-related risks, and digital services to ensure uninterrupted customer support. As its transition into the post-pandemic world, Asuransi Astra continues to place a high emphasis on enhancing its digital offerings and improving its customer service. In this context, the relevance of automated testing in developing digital insurance products has grown significantly. Automated testing offers numerous benefits such as accelerating product development, improving accuracy, and reducing costs by spotting and addressing issues early in the development cycle. Given that cumulative effect, finance sectors like insurance and banking are logical and low-risk places to start an automation journey before expanding to other business functions (Olea, et al., 2023).

Taking these developments into account, this research will focus on assessing the ability of Asuransi Astra's digital teams to implement a fully automated testing process for its digital products. By analyzing various factors that can

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influence the successful implementation of automated testing, this research aims to provide insights in determining what and how many features requires to be selected to be tested by automation within Asuransi Astra's digital products. The research will explore factors such as the team's technical capabilities, available resources, organizational support, and potential challenges to evaluate the readiness and potential for a seamless transition to a fully automated testing process.

1.1. Company Profile

Asuransi Astra, also known as PT Maskapai Asuransi Astra, was founded and opened for business as a general insurance firm on September 12, 1956. In 1981, PT Astra International Tbk. eventually purchased the majority of the shares. It promotes businesses to enhance their performance in order to lead the insurance sector servicing Indonesians. Since 1990, PT Maskapai Asuransi Buana (Asuransi Astra) has changed its name and logo to reflect this transition. Many of its services, such as business insurance, health insurance, and auto insurance, are currently available. With a business license number of S.6364/LK/1995 from the Directorate General of Financial Institutions of the Ministry of Finance of the Republic of Indonesia, Asuransi Astra is already registered and overseen by Otoritas Jasa Keuangan Indonesia (OJK).

1.2. Business Issue

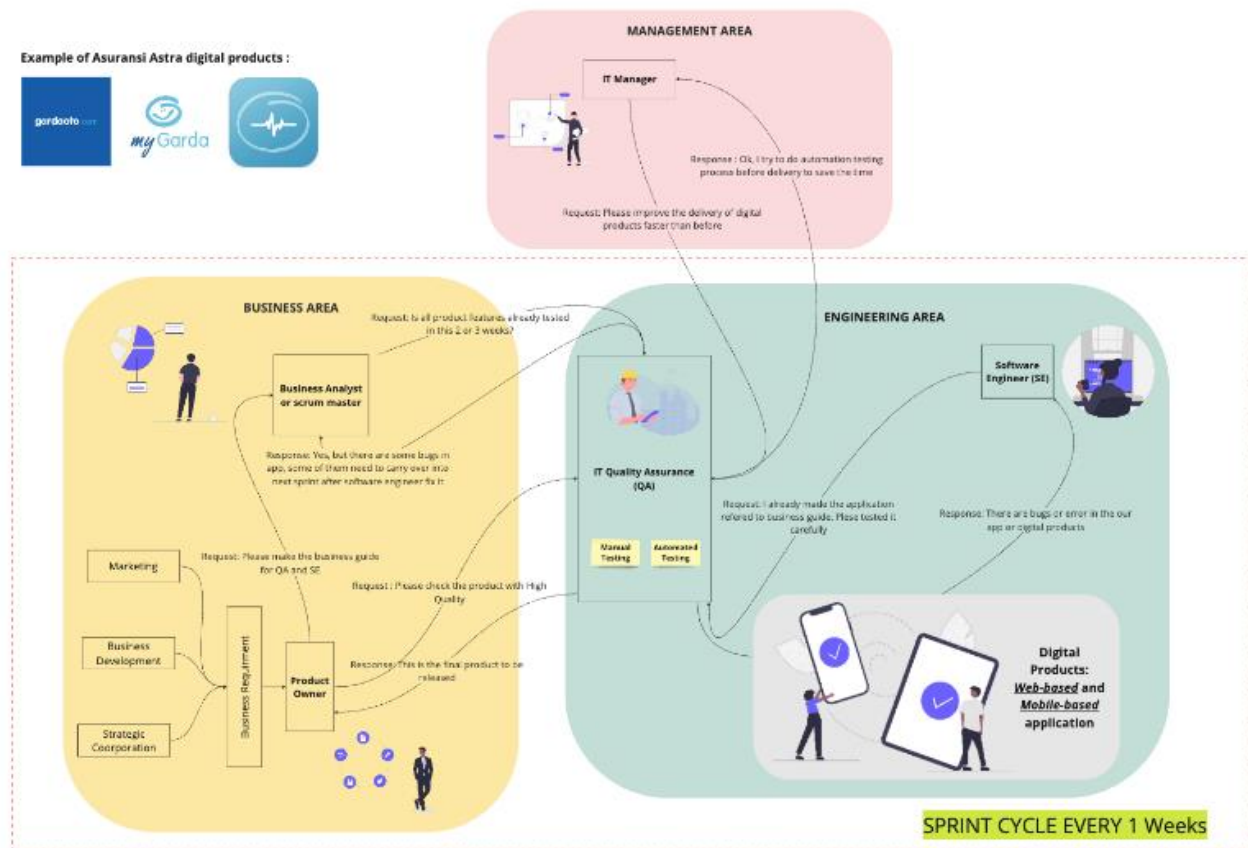


Figure 1. Rich Picture of the QA Process at Asuransi Astra

In Asuransi Astra's digital product team, Quality Assurance or Tester Engineers play a vital role. They make sure that all new products are top quality and ready to launch on time. To make this process smoother and help reduce the workload on engineers, the leaders of the company have mandated to start using automated testing for each product feature that gets released (Darmawi, 2022; Sulivyo et al., 2019).

Some of Asuransi Astra's scrum teams, specialized groups within the digital product team, have begun to embrace automated testing in their product development cycle. But as they tried to expand this approach across all scrum teams

and product features, especially those that must be launched quickly, they faced a significant issue. Not all features are suitable for automated testing, and some still require careful manual testing evaluation by our engineers. This leads to the first major challenge: determining which features should prioritize to be automated testing by QA engineers (Choi et al., 2022; Makki et al., 2017; Mayr-Dorn et al., 2023). It's a critical decision that requires a clear understanding and strategic planning to ensure that the testing process is both efficient and effective (Chatterjee & Dethlefs, 2022; Fukuzaki et al., 2022; Mayr-Dorn et al., 2021).

But integrating automated testing isn't simple. It takes much time to prepare and requires a strong working relationship between QA engineers, software engineers and business analysts. This is a big challenge in their digital division's shift towards automation (Isayas, 2021; OJK, 2021; Priscilia, 2019). The lack of a well-structured plan for how to include automated testing in the development phase adds to the problem. This creates the second issue: how to build effective automation strategies in Asuransi Astra agile development cycle.

1.2.1. Analysis using Fishbone Tree

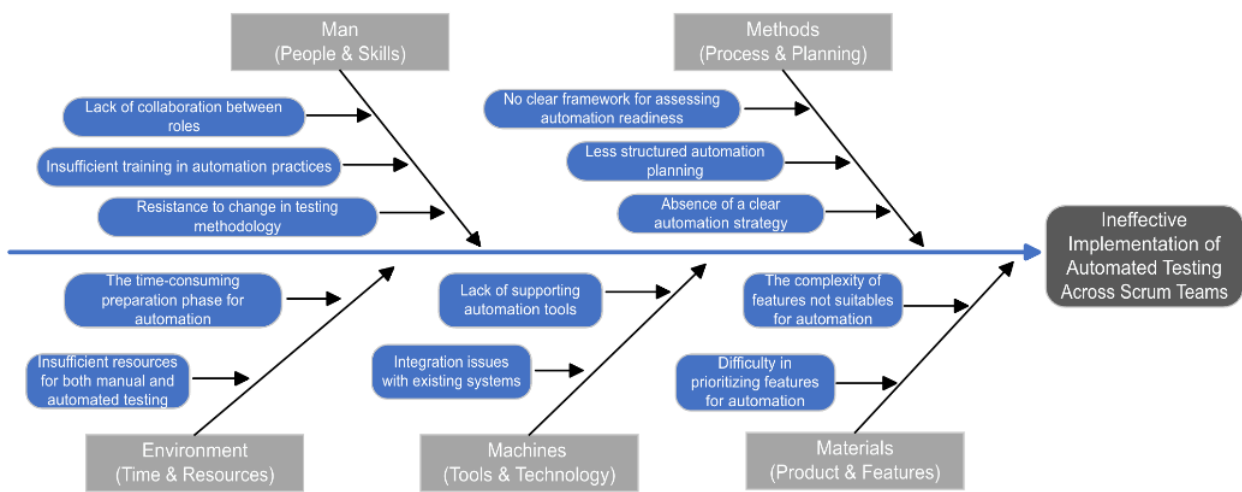


Figure 2. Fishbone Diagram

1.2.2. Analysis using Problem Tree

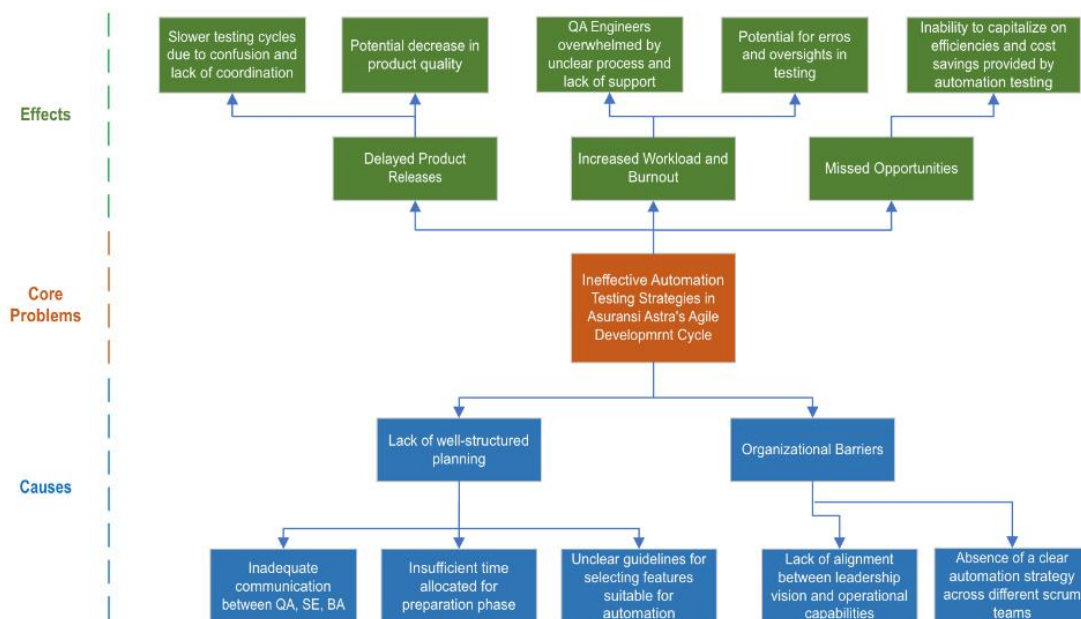


Figure 3. Problem Tree Analysis

1.3. Research Questions

Based on the previous explanations of the business issues and research objectives, this research must answer the following questions:

- a. How to conduct an analysis, decide, separate which features of Asuransi Astra's digital products could be tested by manual or automation?
- b. What criteria and sub-criteria should decision-makers consider in determining the automation testing prioritization?
- c. Which features should be prioritized to be tested by automation?
- d. How to design adequate automaton testing strategies in the scrum team? What can be done to make the sprint cycle more efficient and beneficial?

2. Literature Review

2.1. Literature Review

2.1.1. Insurance

According to Insurance Act No. 40 of 2014, insurance is a contract between an insurance company and a policyholder to provide compensation for losses or legal liability to third parties resulting from uncertain events (Baker & Shortland, 2023; Eling et al., 2022; Weedige et al., 2019). Moreover, insurance can provide reimbursements based on the insured's death or life with predetermined benefits or the results of managing funds. When a customer avails an insurance policy, they essentially transfer a potential risk to an insurance provider. The provider then assesses this risk using various factors and statistical models, and in return, charges the policyholder a premium that corresponds to the evaluated risk (Kaushik et al., 2022; Kiwanuka & Sibindi, 2023; Setiawan et al., 2020).

2.1.2. Product Quality Assurance

Product Quality Assurance or product testing refers to the systematic set of activities and processes implemented to ensure that a product meets predetermined quality standards and fulfills customer requirements. The primary goal of quality assurance is to minimize the cost of ensuring quality by performing a variety of activities throughout the development and manufacturing processes or stages (Galín, 2004). These activities identify and remedy defects as early as possible during the development process. As a consequence, quality assurance activities substantially reduce the rate of non-shippable products and, in most cases, reduce the costs associated with ensuring quality.

2.1.3. Analytic Hierarchy Process (AHP)

AHP was created based on T.L. Saaty's expertise in managing research initiatives for the US Arms Control and Disarmament Agency. It was created in response to the realization that there is a need for more widely accepted, clearly understood, and straightforward methodologies to support the making of complicated decisions. As a result of the AHP's simplicity and use, busy managers and decision-makers have readily adopted it. It aids in arranging the decision-makers thinking and might assist in setting up the issue for easy comprehension and analysis. Alternative selection, resource allocation, forecasting, business process re-engineering, quality function deployment, balanced scorecard, benchmarking, public policy choices, healthcare, and many more are examples of broad domains in which the AHP has been used. Basically the AHP helps in structuring the complexity, measurement and synthesis of rankings (Bhushan & Rai, 2005). It is ideal for a wide range of applications because of these qualities. The AHP has established itself as a technically solid and widely accepted system.

2.1.4. RACI Matrix

The RACI matrix is a responsibility assignment chart that maps out every job, milestone, or important decision involved in completing a project and assigns which roles are Responsible for each action item, which individuals are Accountable, and who needs to be Consulted or Informed, as necessary (Bob Kantor, 2022). The acronym RACI refers to the four responsibilities that stakeholders may have in every project.

2.2. Research Design

The analysis phase kicks off with the clear articulation of business issues, focusing on the need for prioritization of automation for specific features and the enhancement of the overall automation testing strategy. To aid this analysis,

problem-solving tools such as the Fishbone diagram and Problem Tree are employed. The Fishbone diagram provides a comprehensive evaluation of the existing implementation of automation testing over the last two years, identifying causal factors and their effects. Meanwhile, the Problem Tree dissects the current issues causing delays in the implementation of automation testing strategies in scrum teams, providing a systematic understanding of the core problems and their roots.

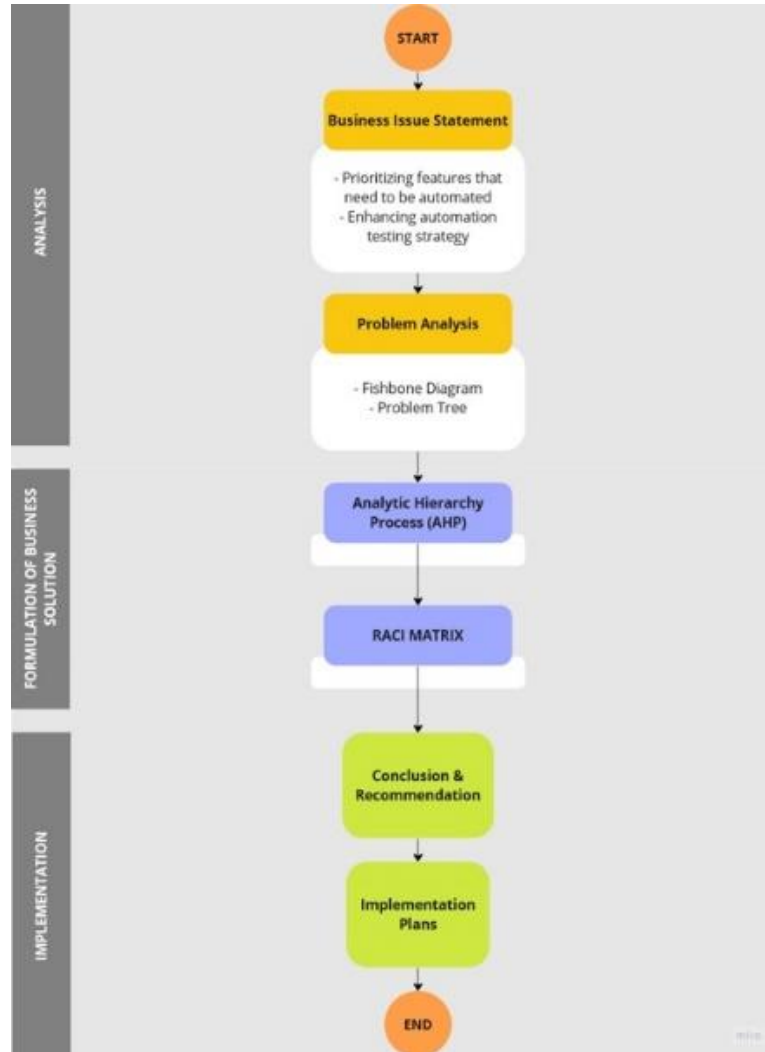


Figure 4. Research Flow Diagram

Following the analysis, the focus shifts to formulating business solutions, employing the Analytic Hierarchy Process (AHP) and the RACI Matrix. The AHP offers a methodical and quantitative approach for decision-making, helping to identify the most important features that should be subjected to automated testing. It prioritizes these based on predefined criteria and alternatives, resulting in a ranked list of recommendations. In tandem, the RACI Matrix helps clarify roles and responsibilities within the teams, ensuring effective collaboration and efficiency in the implementation process.

With the solutions formulated, the research proceeds to provide a robust conclusion and recommendations. This synthesis will offer insights into the current automation strategy, proposed improvements, and their expected impacts.

Finally, the research presents a detailed implementation plan to bring these recommendations to life. This phase encapsulates strategies to ensure smooth transition and execution of the improved automation testing strategy, providing Asuransi Astra a roadmap for its digital transformation journey in testing.

2.3. Conceptual Framework

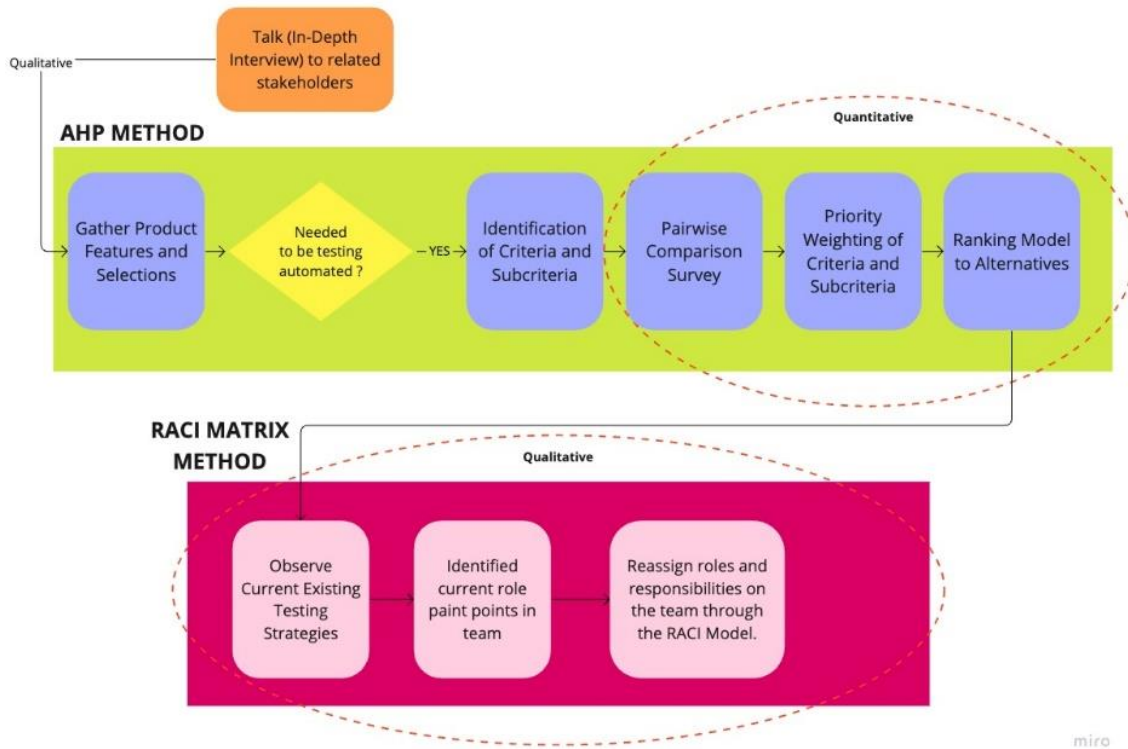


Figure 5. Conceptual Framework

3. Methods

3.1. Data Collection

After determining the research design, the author requires data to assist in answering the research questions and achieving the goals. There is a process known as data collection for gathering necessary data. The author obtains primary data through interviews, surveys, and direct observation.

Table 1. Data collection methods

Data Type	Method	Category	Role Involved	Objective
Primary Data	Interview	Qualitative	IT QA Architect, IT QA Automation	Collect problem, criteria sub criteria, alternatives
	Survey	Quantitative	IT QA Automation	Pairwise comparison on criteria and sub-criteria
	Observation	Qualitative	IT Business Analyst	Collect current testing situation strategy

3.1.1. Qualitative Methodology

In this research, the author will be in regular consultation with seven key respondents. The QA Architect collaborates with the author to establish the criteria and sub-criteria for the AHP model. The QA automation engineers aid the author in identifying the specific features within each digital product that should undergo by automation testing. These selected features will then serve as alternatives in the AHP model. Moreover, these respondents will contribute their expert judgments to a survey or questionnaire to capture pairwise comparisons. The outcome of this process will yield the relative weight of each criterion and sub-criterion.

Table 2. List of Respondents

No	Initial Name	Position	Scrum Team
1	FM	IT QA Architect	-
2	JH	IT QA Automation	Retail - Otoresales
3	MM	IT QA Automation	Retail - MyGarda
4	DA	IT QA Automation	Retail - Core
5	AY	IT QA Automation	Commercial
6	AJ	IT QA Automation	Health - Core
7	MT	IT QA Automation	Health – Garda Medika

The author also employs a qualitative approach to gather data by observing the sprint cycles within three distinct scrum teams: Retail Insurance, Health Insurance, and Commercial Insurance. This observation technique is employed to understand the existing testing strategies used by each of these teams.

Table 3. List of Scrum Team to be Observed

No	Name	Digital Products
1	Retail	Gen5 Retail, MyGarda, Otoresales
2	Commercial	GardaMarine, Otoconnect
3	Health	Garda Medika, Garda Healthtech

This phase involves observing IT Business Analyst which acted as Scrum Master who lead and decide the sprint process. During each sprint cycle, the author carefully notes the various testing approaches adopted, including but not limited to the test planning phase, test case design, execution methods, and the types of testing applied like manual and automation testing.

Table 4. List of Key Things to be Observed

No	Observation Points
1	How are Product Backlog items chosen for the Sprint? What factors influence the selection?
2	How is estimation done? Are they using Story Points, another method?
3	What's the balance between automated and manual testing? How are these processes integrated with development?
4	How are testing tasks prioritized? How early is testing involved in the process?
5	How are automated tests used during the sprint? Are they run daily, on-demand, per build, or per release?
6	How are automated tests developed and maintained?

The focus is also on how these strategies align with the overall sprint goals, backlog items, and how they contribute to the quality of the product being developed. The author pays special attention to any automated testing strategies in place, given the broader context of the research.

3.1.2. Quantitative Methodology

After determining the criteria and sub-criteria through consultation with the QA architect and identifying the alternatives through interviews with the QA automation engineers, the author can proceed with the Analytic Hierarchy Process (AHP) to generate quantitative data. Here's a simplified version of how this process would work:

Table 5. List of Quantitative Data Source

Data Purpose	Data Source
Analytical Hierarchy Process (AHP)	Pairwise Comparison Matrices Weights of Criteria and Alternatives Final Scores and Rankings

- a. Pairwise Comparison Matrices (Data source: Expert Judgments from Survey): The automation decision-makers in scrum team, which is QA automation engineers, are asked to score the relative importance or preference between each pair of criteria, sub-criteria, and alternatives. This scoring typically employs a scale from 1 to 9, with 1 signifying equal importance and 9 indicating extreme importance of one element over the other. The results of these judgments are used to construct the pairwise comparison matrices.

- b. Weights of Criteria and Alternatives (Data source: Pairwise Comparison Matrices): The next step involves calculating the weights for each criterion, sub-criterion, and alternative. This is done using the information from the pairwise comparison matrices. The author calculates the eigenvalue or geometric mean of each entry in the matrix, then normalizes these values so that their sum equals 1. The resulting weights represent the relative importance or preference assigned to the criteria, sub-criteria, and options.
- c. Final Scores and Rankings (Data source: Weights of Criteria and Alternatives): With the weights of the criteria, sub-criteria, and alternatives in hand, the author can compute the final scores for each alternative. This involves multiplying the weights of the alternatives by the corresponding weights of the related criteria and sub-criteria, and summing these values. The alternatives are then ranked according to these final scores, providing a quantitative hierarchy of the alternatives.

4. Result and Discussions

4.1. Analytical Hierarchy Process (AHP)

4.1.1. The AHP Structure

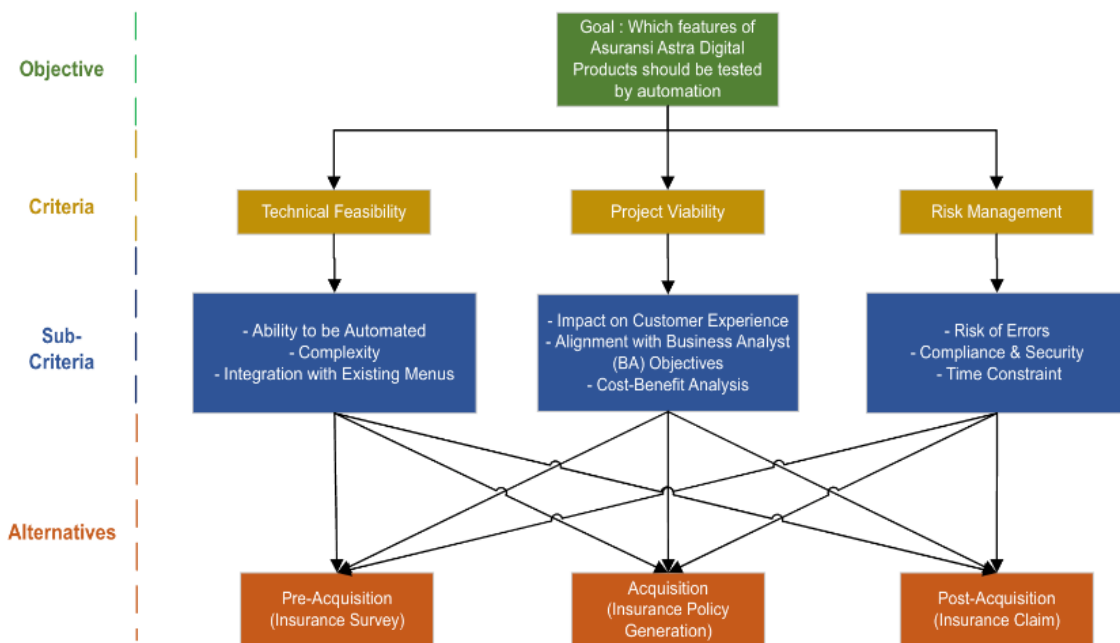


Figure 6. AHP Structure

The primary objective of this decision-making process is to identify the most consequential features to be automated tested within Asuransi Astra Digital Products. The framework of the AHP strategy can be visualized as a tree, its robust roots firmly grounded in three fundamental criteria: Technical Feasibility, Project Viability, and Risk Management.

- **Technical Feasibility:** This criterion emphasizes the automation's practicability. Questions lead to sub-criteria arise such as: Is it capable of being automated tested? is the feature process complex? And most importantly, does it integrate with current systems?
- **Project Viability:** This criterion looks beyond technicalities, taking into account the customer's perspective. The objective is to assess the strategic viability of features in relation to business goals. These leads to the sub-criteria points such as impact on customer experience, alignment with business analyst (BA) objectives, and cost-benefit analysis.
- **Risk Management:** This criterion evaluates potential pitfalls to ensure that standards in the automation testing are met and the process stays on track. Several sub-criteria arise, such as the risk of errors, compliance & security, and time constraint.

4.1.2. *Pairwise Comparison on Criteria and Sub-Criteria*

At the first stage of the survey, pairwise comparison towards criteria is taken to know which of the most criteria that are important when the QA engineers deciding to automate the feature of the application. There are six respondent or decision-makers that fill the questionnaire during the decision.

Table 6 below shows the results of assessment from decision-makers in comparing each criterion. Some of them choose the risk management is important and technical feasibility also. The average calculation stated that technical feasibility is the number one concerns when they want to build the automation project. With the local weight 0.503 comparing to 0.305 for risk management, they said that knowing how big the application and features inside it are the first thing to see before considers the risk management and project viability. If the automate project is not technically feasible, it will not be successful regardless of how well the other factors are managed.

Risk management became the second important criterion because it assess and mitigates the risk associated with the automated test project. It is important to consider this factor early on in the project planning process so that risks can be identified and addressed before it cause problems. Once these two criteria have been addressed, QA engineers can then work with other stakeholders to assess the project viability.

Table 6. Pairwise comparison result on criteria

Criteria	Local Weight	Inconsistency Rate (CR)
Technical Feasibility	0.503	0.002
Project Viability	0.192	
Risk Management	0.305	

At the second stage of the survey, decision makers are asked to fill the pairwise comparison questionnaire towards sub-criteria. For the first criterion, they compare between sub-criterion under technical feasibility. Through the average calculation in Table 7, complexity sets the higher score between others. It has 0.420 score comparing to 0.404 from ability to be automated and 0.175 by integration with existing menus. Some of the respondent commented that complex application and feature inside it are sometimes more difficult to test by automation because it has more interactions and more potential failure points. QA engineers need to prioritize automating the complex area of the application first in order to reduce the risk of failure and to maximize the benefits of automation.

Ability to be automated also the seconds prioritization after complexity. Not all areas of an application can be automation tested. For example, areas that require human judgement or manual tested or that are to dynamic to be easily scripted may not be automatable. And then, as the third prioritization, automated tests sometimes should be integrated with existing menus and dashboards so that they can easily executed and maintained.

In second criterion, decision makers focus on assessing between sub-criterion under project viability. Align with business objectives get slighter result compared with impact on customer experience. It only differs about 0.019 point where 0.368 for impact on customer experience and 0.349 for align with business objectives and far when compared to cost-benefit analysis, which is 0.283.

This is understandable from the respondents perspectives because their job as QA is to ensure that the product meets the needs of customer and delivers a positive user experience. So that, impact on customer experience is the number one priority in project viability. Automated test can help to achieve that goal by reducing the number of defects in the product and improving the efficiency of the testing process. Alignment with business objectives is also important and became the second priority. QA play a business-critical function, and they need to ensure that their work is aligned with the overall goals of the business. And at third, cost-benefit analysis is also important factor to consider when deciding whether to automate some features of the application. Automated test can save time and money in the long run, but they can also be expensive to develop and maintain. QA engineers need to carefully consider it before making a decision.

For the last criterion, determination by decision-makers targeted the comparison between sub-criterion under risk management. Time constraint get the highest value, 0.352 followed by compliance & security, 0.337 and risk of errors 0.311.

It appears that respondent are most concerned with the time constraints when it comes to risk management for automated test projects. This is understandable, as automation testing are connected through some services and databases that need several times to transferring the data each other. They, as a QA engineers need to develop and executed the automate test quickly and efficiently. In the other side, compliance and security also important concerns, but it is slightly less

important than time constraint. QA's usually have a number of tools and techniques to help them manage the automation scripts comply with company policies and regulations.

Table 7. Pairwise comparison result on sub-criteria

Criteria	Sub-Criteria	Local Weight	Inconsistency Rate (CR)	Global Weight	Rank
Technical Feasibility	Ability to be Automated	0.404	0.000	0.203	2
	Complexity	0.42		0.211	1
	Integration with Existing Menus	0.175		0.088	6
	Impact on Customer Experience	0.368		0.071	7
Project Viability	Align with Business Objectives	0.349	0.002	0.067	8
	Cost-Benefit Analysis	0.283		0.054	9
	Risk of Errors	0.311		0.095	5
Risk Management	Compliance & Security	0.337	0.002	0.103	4
	Time Constraints	0.352		0.107	3

Like the first stage of the survey, decision makers also have different judgement between the comparison each. Table 7 shows us that average calculation of global weight serves as a pivotal value for establishing rankings among the sub-criteria. Global weight is obtained from the results of multiplying local weight of criteria at first stage with local weight of each sub-criteria at second stage.

Figure 7 visualize more detail in a bar chart in terms on ranking from twelve sub-criteria. Respondent agree that complexity, which is the value is 0.211 became the first prioritization concerns. It is followed by ability to be automated which get the results 0.203 at the second and time constraints with 0.107 at the third most important concerns. These rankings offer a clear hierarchy of priorities, providing valuable guidance for decision-makers in their focus, resources, and concerns towards addressing the most critical aspect when started to make the automation test project in Asuransi Astra’s digital products.

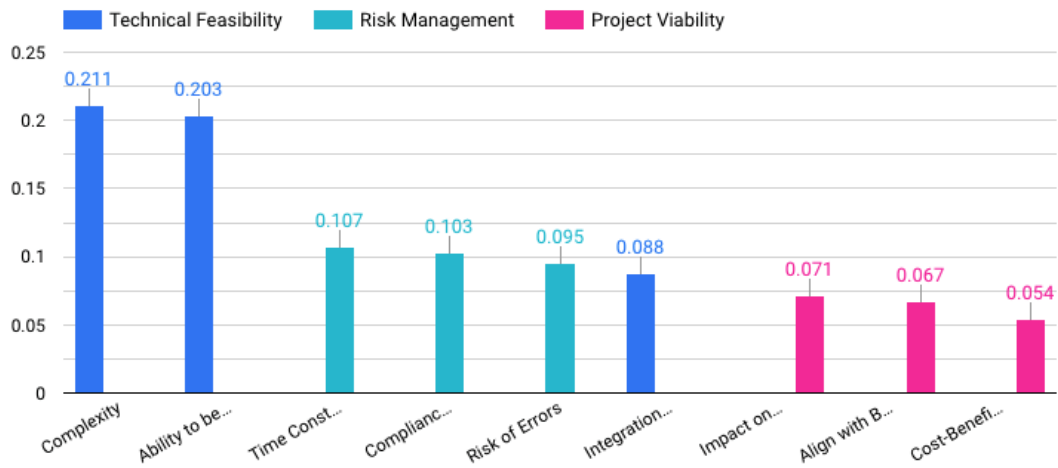


Figure 7. Global Weight of Each Sub-Criteria

4.1.3. Pairwise Comparison on Alternatives

At this stage, author already gets the global weight for each sub-criterion from the previous calculation. The next process is to apply those weight into the every available alternatives. Similar to what was done before, decision-makers needs to compare each alternative on each criterion and sub-criterion. They must assess whether to prioritize pre-acquisition or acquisition or post-acquisition as a three big features that need to create its automated testing project first. The result calculation is outlined in aggregate weighted by adding up the result of multiplication between weight from each alternatives and global weight for each sub-criterion

Table 8. Pairwise comparison result on alternatives

Alternatives	Local Weights									Aggregate Weighted (Global Weight)	Rank
	Ability to be Automated	Complexity	Integration with Existing Menus	Impact on Customer Experience	Align with Business Objectives	Cost-Benefit Analysis	Risk of Errors	Compliance & Security	Time Constraints		
Pre-Acquisition	0.239	0.162	0.145	0.155	0.125	0.106	0.151	0.154	0.132	0.165	3
Acquisition	0.411	0.331	0.528	0.456	0.405	0.663	0.543	0.59	0.391	0.449	1
Post-Acquisition	0.35	0.507	0.326	0.389	0.471	0.231	0.305	0.256	0.478	0.385	2
Inconsistency Rate (CR)	0.05	0.03	0	0.05	0.01	0.09	0	0.01	0.01		

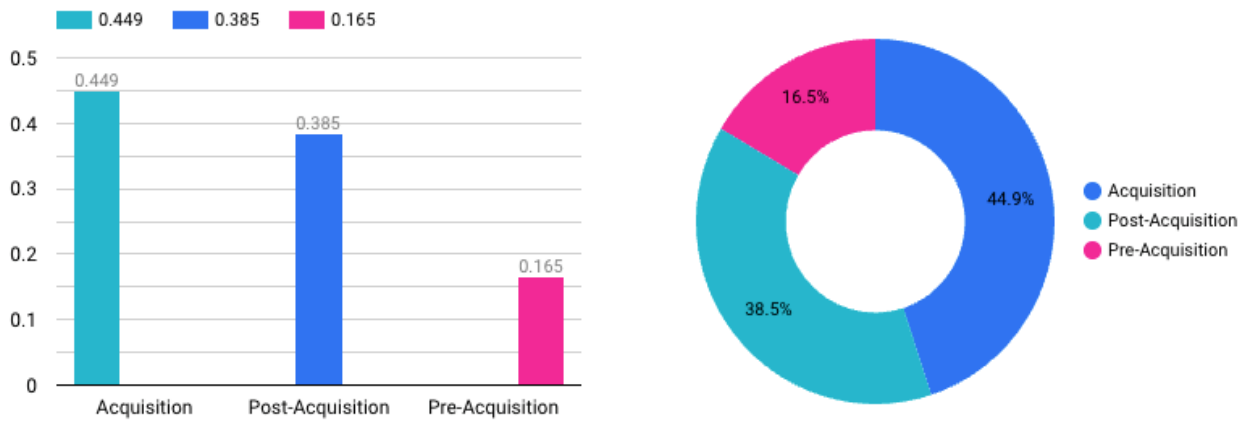


Figure 8. Aggregate Weighted of Alternatives

Based on that result acquisition has the highest aggregated weighted, 0.449. Decision-makers agree that acquisition needed to prioritized first, and then post-acquisition and followed by pre-acquisition. Here’s some reason based on their judgement:

1) Insurance Acquisition Feature (First Priority)

- **Business Impact:** The acquisition phase is typically where the customer commits to the insurance product, buy the insurance policies, and pay it. Prioritizing this feature to be automated tested aligns with the business goal of delivering a seamless and reliable customer experience.
- **Complexity and Sensitivity:** QA engineers know this process inherently complex and sensitive, involving critical data and interactions. Automating this phase first allows for precise testing and validation to ensure accuracy and security.

2) Post-Acquisition Feature (Second Priority)

- **Claim Processing and Customer Satisfaction:** QA engineers recognize the post-acquisition phase as an area crucial for customer because this is the main reason why they want to purchase the insurance products. If the digital process of claim are not going smoothly throughout the application, they will wondering why I should invest my protection in here.
- **Data Handling and Compliance:** Post-acquisition involves sophisticated data handling and compliance checks as a result of claim processing. The main and supporting data become one here. Doing automate testing in this phase can reduce the likelihood of errors and bolstering data security.

3) Pre-Acquisition Feature (Third Priority)

- Initial Customer Interaction: QA engineers observe the pre-acquisition phase as the first stage in the insurance process involving the initial customer interaction, which, while important, may not be as operationally complex as the acquisition and post-acquisition phases. This happens because most of the pre-acquisition process happened in the field where the application for this feature only as an intermediary to store the data.
- Risk Mitigation: By prioritizing pre-acquisition at third, QA engineers can focus on refining and optimizing the previous automation test due to more operationally complex. This way minimizes the risk of overlooking critical elements in the initial stages of automation implementation.

4.2. RACI Matrix

4.2.1. Observation Current Testing Strategies

The observation encompasses three scrum teams that cater to the retail, commercial, and health business segments. Monitoring these teams' testing strategies is critical for maintaining product quality, creating a continuous improvement mindset, and reaching long-term company objectives. The observation results through key things shown in Table 9.

Table 9. Observation Results through Key Things

No	Observation Points	Retail Scrum Team	Commercial Scrum Team	Health Scrum Team
1	How are Product Backlog items chosen for the Sprint? What factors influence the selection?	Backlog are selected based on focusing in enhancing retail existing feature or menu in existing application.	Backlog are selected based on the needs for migrating existing menu or feature from old application to new commercial application.	Backlog are selected based on the need for integration with third party medical partner and improving health existing feature or menu.
2	How is estimation done? Are they using Story Points, another method?	The team uses story point for estimation, considering the complexity, effort, and risk.	The team uses story point for estimation, considering the complexity, effort, and risk.	The team uses story point for estimation, considering the complexity, effort, and risk.
3	What's the balance between automated and manual testing? How are these processes integrated with development?	A 70-30 ratio between manual and automated testing. Automated testing is primarily used for regression testing, while manual testing focused on usability testing.	A 85-15 ratio between manual and automated testing. Automated test are used for data validation and security checks throughout API, while manual testing focused on usability.	A 80-20 ratio between manual and automated testing. Automated is primarily used for regression testing, while manual testing focused on usability testing.
4	How are testing tasks prioritized? How early is testing involved in the process?	Testing task are prioritized based on the criticality of the associated features to be used by retail insurance team immediately.	Testing task are prioritized based on the criticality of the associated features to be used by commercial insurance team immediately.	Testing task are prioritized based on the criticality of the associated features to be used by health insurance team immediately.

No	Observation Points	Retail Scrum Team	Commercial Scrum Team	Health Scrum Team
5	How are automated tests used during the sprint? Are they run daily, on-demand, per build, or per release?	Automated test are used for regression testing and supporting automatic data needs like retail policy generation, claim generation including lk & spk. Run on-demand and after sprint cycle ended.	Automated test are used for regression testing and supporting automatic data needs like commercial policy generation. Run on-demand based on needs and daily in the night,	Automated test are used for regression testing and supporting automatic data needs like health policy generation, claim generation. Run on-demand based on needs and daily in the night.
6	How are automated tests developed and maintained?	Test are developed in parallel with development activity by developers and maintained through a collaboration with retail qa engineers using a shared repository	Test are developed after the development activity done by developers and maintained through a single repository by one qa engineer.	Test are developed after the development activity done by developers and maintained through a single repository by one qa engineer.

4.2.2. Identified Current Role Paint Points in Teams

A sprint, as its name, is a brief period during which a scrum team works to finish a specific amount of work. Sprints are essential for the agile team to release better products with fewer issues. Usually, sprints are held for 2-3 weeks in a month, but in Asuransi Astra, every scrum team must complete the task only for one week. The difference is every task is broken down into a small piece backlog to make installments of menus or features one by one.

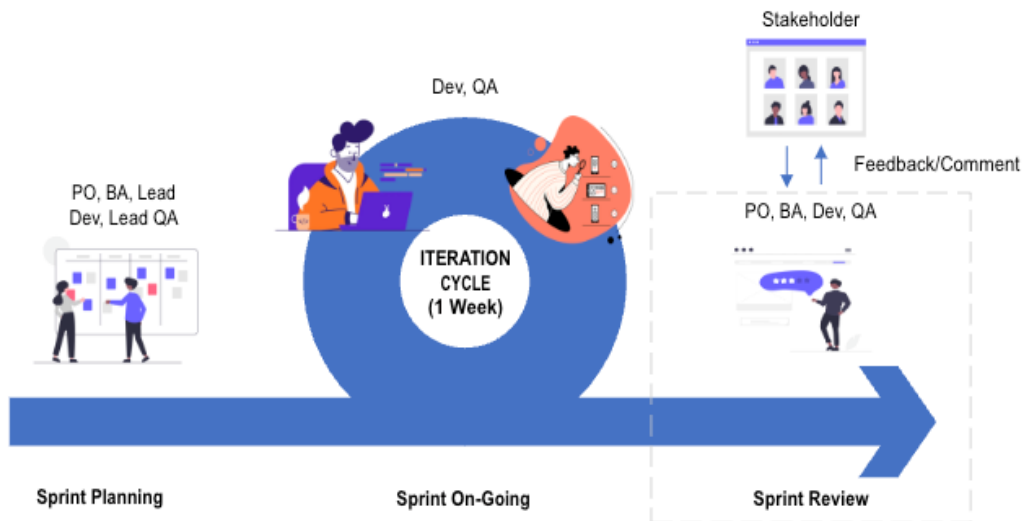


Figure 9. Sprint Cycle at Asuransi Astra’s Digital Team

Table 10. Role Paint Point

No	Roles	Sprint Planning Phase	Sprint On-Going Phase	Sprint Review Phase
1	Product Owner(PO)	POs across teams face challenges in clearly articulating and	Sometimes constant adjustments are needed due to evolving stakeholder	Managing stakeholder feedback and concerns regarding delivered

No	Roles	Sprint Planning Phase	Sprint On-Going Phase	Sprint Review Phase
		prioritizing backlog items, balancing between technical feasibility and business impact.	expectations and market demands, causing frustration and requiring continuous alignment with the team’s focus.	features is critical, with a need to navigate through varying opinions and expectations for the next sprint’s direction.
2	Business Analyst (BA)	BAs sometimes struggle with providing detailed and accurate requirements, usually due to a lack of technical understanding or rapidly changing requirements from PO.	There's a need for continuous clarification and refinement of requirements as new challenges and insights emerge during the sprint.	BAs need to reconcile the gap between initial requirements and delivered features, translating stakeholder feedback into actionable insights for the next sprint.
3	Developers (Lead, Member)	Developers face uncertainty and concerns about implementing the proposed backlog items due to ambiguous or incomplete requirements and technical challenges.	They often deal with coding uncertainties and delays due to evolving requirements and struggle with implementing designs that must balance aesthetic and functional considerations.	Devs face late feedback that may necessitate significant code revisions and deal with critiques on the technical performance of delivered features.
4	Quality Assurance (Lead, Member)	QAs sometimes lack clear testing criteria for new features and struggle with planning tests for complex or subjective areas.	With suddenly changing requirements, ensuring comprehensive testing becomes challenging, along with the development of effective tests for innovative or complex features.	Overlooked testing scenarios and undiscovered bugs coming to light during stakeholder feedback require responsive adjustments and improvements for future testing cycles.

4.2.3. Reassign Roles and Responsibilities through RACI Model

Based on the pain point identification, it is evident that there are occasional gaps in tasks and responsibilities within the development process, particularly among QA, Dev, and BA roles, especially when faced with ambiguous requirements from stakeholders or backlogs presented by the product owner (PO). It is essential to address these challenges, and the RACI Matrix Model provides a structured solution. By designating roles and assigning Responsibility (R), Accountability (A), Consultees (C), and Informees (I), the RACI Matrix will eliminate confusion and ensure that each task has a precise proprietor. Consequently, utilizing the RACI Matrix Model can significantly improve the clarity and efficacy of project execution, leading to improved results and more satisfied stakeholders.

Table 11. Role Paint into RACI Model

No	Project Task/Activity during Sprint	PO		Lead Dev			QA	
		PO	BA	Lead Dev	Dev	Lead QA	QA Manual	QA Automation
1	Clearly articulate and prioritize backlog items	R	A	C	I	C	I	I

No	Project Task/Activity during Sprint	PO	BA	Lead Dev	Dev	Lead QA	QA Manual	QA Automation
2	Balance technical feasibility and business impact	R	R	C	I	C	I	I
3	Adjust to evolving stakeholder expectation	R	C	I	I	I	I	I
4	Align team's focus with market demands	R	C	I	I	I	I	I
5	Manage stakeholder feedback on delivered features	R	A	C	I	C	I	I
6	Navigate opinions for next sprint's direction	R	A	I	I	I	I	I
7	Provide detailed and accurate requirements	A	R	C	I	C	I	I
8	Clarify and refine requirements during sprint	A	R	C	I	I	I	I
9	Reconcile initial requirements with delivered features	A	R	C	I	C	I	I
10	Translate feedback into insights for next sprint	R	R	C	I	C	I	I
11	Address ambiguous/incomplete requirements	A	A	R	R	C	I	I
12	Tackle technical challenges in backlog items	A	C	R	R	C	I	I

No	Project Task/Activity during Sprint	PO	BA	Lead Dev	Dev	Lead QA	QA Manual	QA Automation
13	Deal with coding uncertainties due to evolving requirements	A	A	R	R	C	I	C
14	Implement balanced design considerations	A	A	R	R	I	I	I
15	Address feedback on code revisions	I	C	R	R	C	I	C
16	Manage critiques on technical performance of features	I	A	R	R	A	I	R
17	Establish clear testing criteria for new features	I	A	C	I	R	I	I
18	Plan tests case for complex/subjective areas	I	A	C	I	R	I	I
19	Develop tests case for innovative/complex features	I	A	C	C	R	R	R
20	Ensure comprehensive testing amid changing requirements	I	C	C	I	A	R	R
21	Develop automation testing scheme	I	I	C	I	A	I	R
22	Implement automation testing through regression	I	I	I	I	A	I	R
23	Adjust to feedback on	I	A	I	I	R	I	I

No	Project Task/Activity during Sprint	PO	BA	Lead Dev	Dev	Lead QA	QA Manual	QA Automation
	overlooked testing scenarios							
24	Improved future testing cycles based on feedback	I	A	I	I	R	R	R

4.3. Implementation Plan

Table 12. Implementation Plan

No	Activities	2024	2025	2027
1	Develop automation testing for acquisition feature			
2	Develop automation testing for post-acquisition feature			
3	Develop automation testing for pre-acquisition feature			

5. Conclusions

In terms of solving the first business problem, determining which features should be prioritized to be automated testing by QA engineers is required to structure the hierarchy of the decision-making method. This is solved by using Analytical Hierarchy Processing (AHP). The AHP structure starts with introducing three (3) criteria among *Technical Feasibility*, *Project Viability*, *Risk Management* and nine (9) sub-criteria composing *Ability to be Automated*, *Complexity*, *Integration with Existing Menus*, *Impact on Customer Experience*, *Alignment with Business Analyst Objectives*, *Cost-Benefit Analysis*, *Risk of Errors*, *Compliance & Security*, *Time Constraint* which lead to three (3) alternatives which are *Pre-Acquisition*, *Acquisition*, and *Post-Acquisition*. Based on the pairwise comparison of sub-criteria, respondents consider *Complexity* (0.211) as the first concern when starting the automation test project, followed by the *Ability to be Automated* (0.203) and *Time Constraints* (0.107). They also admit towards an alternative that *Acquisition* (0.499) is the crucial feature that must be automated first due to the sensitivity and impact to the business, tailed with *Post-Acquisition* (0.385), which hold claim processing, and last *Pre-Acquisition* (0.165). The RACI matrix model helps to solves the second business issue of building effective automation strategies in Asuransi Astra's product development cycle. It ensures that all project tasks and activities are assigned specific responsibilities, such as defining backlog items and creating automated testing schemes. As a result, it is viable to comprehend who is accountable, responsible, consulted, or informed at each stage. The model has facilitated understanding role expectations and aligned team efforts, allowing for a more synchronized approach towards teamwork and strategy.

As the author passes through the results and implications, it becomes evident that the unity of cautious observation, strategic problem-solving frameworks, and technological integrations can improve Asuransi Astra's current digital services. Those findings offer actionable strategies for product implementation and act as a foundation of continuous improvement and adaptability to the market and consumers.

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