



Software Proposal Document

Prodigy: Support Tracker

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Revision History

Revision	Revision Date	Revision Authors	Reviewed by	Review Date
0	6 th June 2023	Shaun Broomfield & Tom Atkinson	Ashley Tizard	9 th June 2023
Description				
The initial version of the Proposal Document created.				

Revision	Revision Date	Revision Authors	Reviewed by	Review Date
1	16 th June 2023	Shaun Broomfield		
Description				
<p>The following changes have been made:</p> <ul style="list-style-type: none"> Project name changed from 'Ticket Master' to 'Support Tracker', due to the prior name already being taken. 'Stakeholders' section added to explicitly define relevant information, whereas before that had to be found within description in other sections. 'Quantitative Incentives' section added to explicitly define relevant information, whereas before that had to be found within description in other sections. Overhauled deliverables section post project consensus meeting. The deliverables section now has a lot more in the way of details due to necessity to clarify the direction and scope of the project. 				



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1. Proposal

The purpose of the following project proposal document is to provide a comprehensive understanding of the Tascomp Support Ticketing System. It will provide a detailed overview of the systems scope, deliverables and what will be required.

Though Tascomp has a diverse set of income sources, one of our primary and continuous sources of income stems from support contracts with customers who make use of our Prodigy, PlantRun, and PAMS systems at various sites. Given the nature of our business model, it's imperative to maintain a robust, well-managed, and easy-to-use system for handling support issues.

However, our current system, which wasn't originally designed for logging support events and tracking all associated interactions, has proven rather unwieldy when used as a ticketing system. This is because its primary design was to manage an entirely different set of operations regarding support contracts.

Therefore, the introduction of a new, dedicated ticketing system should significantly enhance our existing support processes, adding further justification for these crucial support contracts. Additionally, certain clients, particularly those affiliated with government agencies, require us to provide distinct support ticket IDs in order to meet their specific requirements.

The new Support Ticketing System, currently named Support Tracker, will be an internal tool used by Tascomp to effectively manage and track customer inquiries, technical issues, and support requests. The overarching aim is to streamline communication, thus expediting the resolution time for reported issues.

Although achieving full compliance with the ITIL standards for a ticketing system is a goal that surpasses the scope of this specific project, Support Tracker will nonetheless fulfil the fundamental requirements associated with any standard ticketing system.



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2. Deliverables

The set of deliverables for each requirement will be purposefully kept uncomplicated, with the intention of containing the project within its current scope. However, we will devote particular attention to the design and adherence to these deliverables. By doing so, we aim to facilitate a smoother expansion of the project in the future, extending beyond its initial boundaries.

The primary requirements for the project, within its current scope, are as outlined below:

2.1 Database

This will serve as a vital component of our system, as it will house the relevant information in a structured and efficient manner, allowing for effective storage, retrieval, and seamless integration with other internal tools.

2.2 Front End Application

This software will facilitate the management, visualisation, and effective utilisation of the data stored in the database. It has to provide an intuitive interface that will allow users to interact with the data with ease.

2.2.1 Ticket List View

When a user opens the application, they should be greeted with a form that provides a list of all tickets. This ticket list will have filtering functionality, some of which will be selected by default:

Default Filtering
Open Tickets (<i>Any Ticket where their status is not closed</i>)
Tickets where events include the engineer opening the application.
Tickets where the engineer opening the application is listed as the primary engineer.

The user will be able to modify any of the following filtering:

Available Filtering
Ticket event status <Can (Inclusive) Select Multiple>
Ticket event types <Can (Inclusive) Select Multiple>
Ticket's customer
Ticket's contract number
Tickets events where the engineer is: <Select Engineer>
Tickets where the primary engineer is: <Select Engineer>

This form will also have buttons to manage selected tickets and do the following:

- View Ticket
- Add Ticket
- Remove Ticket



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2.2.2 Ticket View

When a user in the 'Ticket List View' either views a selected ticket or creates a ticket, the 'Ticket View' will appear in place of the 'Ticket List View'.

The 'Ticket View' exists to display and manage all information regarding a ticket. This includes ticket-specific information, as well as all of a ticket's events and their overview information.

The ticket information that will be accessible in this view will be the following:

Accessible Ticket Information			
Information	Required	Provided by Default	Mutable
Ticket ID	Yes	Yes	No
Ticket Status	Yes	Yes	Yes
Ticket-Event Types	Yes	No	Yes ~ (<i>Mutated by last Ticket Event</i>)
Contract Number	Yes	No	Yes ~ (<i>Mutates Customer</i>)
Customer	Yes	No	Yes ~ (<i>Mutates Contract Number</i>)
Build and Number	Yes	No	Yes
Primary Engineer	Yes	Yes	Yes
Primary Contact	Yes	No	Yes
Related Programs	No	No	Yes
Overview	Yes	No	Yes
Notes	No	No	Yes
Awaiting Reason	No	No	Yes
Awaiting Engineer	No	No	Yes
Awaiting Contact	No	No	Yes
Ticket Creation Date	~ <Calculated>	Yes	No
Ticket Closed Date	~ <Calculated>	Yes ~ (<i>Only If Ticket is Closed</i>)	No
Ticket Creation Engineer	~ <Calculated>	Yes	No
Ticket Closed Engineer	~ <Calculated>	Yes ~ (<i>Only If Ticket is Closed</i>)	No
Time Since Ticket Creation	~ <Calculated>	Yes	No
Ticket Duration	~ <Calculated>	Yes	No
Linked Files	No	No	Yes ~ (<i>Also mutated by last Ticket Event</i>)
Linked Mantis References	No	No	Yes ~ (<i>Also mutated by last Ticket Event</i>)



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This view will not only display information specific to a ticket, but also a list of all of the events related to a ticket. Each ticket event displayed in the list will appear with an overview of their information and all will be ordered in the list by timestamp.

The user has the ability to assign files to the ticket and the ticket's events. All files assigned to any ticket events will also be assigned to the event's ticket.

The user also has the ability to assign Mantis references to the ticket and the ticket's events. Like assigned files, all Mantis references assigned to any ticket events will also be assigned to the event's ticket.

This form will also have buttons to manage selected ticket events and do the following:

- View Ticket Event
- Add Ticket Event
- Remove Ticket Event

2.2.3 Event View

When a user in the 'Ticket View' either views a selected ticket event or creates a ticket event, the 'Event View' will appear in place of the 'Ticket View'.

The 'Event View' exists to display and manage all information regarding a ticket event. This includes event-specific information.

The event information that will be accessible in this view will be the following:

Accessible Event Information			
Information	Required	Provided by Default	Mutable
Event ID	Yes	Yes	No
Event Types	Yes	No	Yes
Event Types	Yes	No	Yes
Event Engineer	Yes	Yes	Yes
Event Contact	Yes	No	Yes
Related Program	No	No	Yes
Overview	Yes	No	Yes
Notes	No	No	Yes
Event Creation Date	~ <Calculated>	Yes	No
Event Creation Engineer	~ <Calculated>	Yes	No
Event Timestamp	Yes	Yes	Yes
Event Duration	Yes	Yes	Yes
Linked Files	No	No	Yes
Linked Mantis Reference	No	No	Yes



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The user has the ability to assign files to the event, in doing this the file is also assigned to the ticket.

The user also has the ability to assign Mantis references to the event, like assigned files, all Mantis references assigned to any events will also be assigned to the event's ticket.



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3. Stakeholders

Stakeholders	Stake
Senior Leadership Team	<ul style="list-style-type: none"> Increased operational efficiency by reducing support ticket resolution time. Improved cost-effectiveness through optimized resource allocation. Enhanced decision-making based on real-time data and analytics. Ability to meet additional certifications and industry standards due to the enhanced auditing processes facilitated by the streamlined support ticketing system. Access to a wider range of higher quality and profitable contracts as a result of improved compliance and traceability.
Applications Team	<ul style="list-style-type: none"> Decreased response time for resolving software-related issues. Streamlined communication channels for efficient collaboration and knowledge sharing. Improved productivity by reducing the time spent on manual ticket management tasks.
Software Team	<ul style="list-style-type: none"> Decreased response time for resolving software-related issues. Streamlined communication channels for efficient collaboration and knowledge sharing. Improved productivity by reducing the time spent on manual ticket management tasks.
Hardware Team	<ul style="list-style-type: none"> Reduced downtime by quickly identifying and resolving hardware-related issues. Streamlined coordination with other teams for faster problem resolution. Improved resource utilization through better tracking and prioritization of hardware support requests. Simplified and standardised Return Merchandise Authorization (RMA) process through the provision of Ticket or Ticket Event GUIDs. Enhanced customer satisfaction by offering a seamless RMA experience for those that require it in their own systems.
Supported Customers	<ul style="list-style-type: none"> Faster response and resolution times for their support tickets. Enhanced customer experience through improved communication and transparency. Increased satisfaction due to a streamlined and efficient support process. Integration capability with their internal systems by logging and tracking support events using the provided Ticket and Event GUIDs as a form of RMA.



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4. Quantitative Incentives

Incentive	Reasoning
Enhanced Efficiency	The new streamlined internal support ticketing system will significantly improve operational efficiency by reducing response times and minimising manual processes, leading to increased productivity and time savings for the senior leadership team.
Cost Savings	The implementation of the new system will result in cost savings by reducing the need for dedicated support staff, streamlining workflows, and minimizing errors. These savings can be reinvested in other areas of the company or allocated to strategic initiatives.
Data-Driven Insights	The system generates valuable data and metrics on support tickets, allowing senior leadership to identify trends, areas for improvement, and potential training needs. This data-driven approach enables informed decision-making and more effective resource allocation.
Risk Mitigation	By implementing a centralised support ticketing system, the company can reduce the risk of lost or misplaced tickets, ensuring that no customer requests or critical issues fall through the cracks. This mitigates potential reputational risks and customer dissatisfaction.
Enhanced Customer Experience	The efficient handling of support tickets will result in faster issue resolution for customers, leading to increased customer satisfaction and loyalty. This positive customer experience can have a direct impact on the company's reputation and bottom line.
Compliance and Accountability	The streamlined system will enable better tracking and monitoring of support ticket status, ensuring accountability and compliance with service level agreements (SLAs) and other performance metrics. This will help the senior leadership team in maintaining high standards of customer service and meeting regulatory requirements.
Improved Decision Making	The system's potential for comprehensive reporting and analytics capabilities will provide all teams with different sets of historical and real-time data and insights on support ticket trends, allowing for informed decision making and proactive problem-solving.
Enhanced Auditing Capabilities	The incorporation of robust auditing features within the ticketing system will enable the organization to meet new certifications, standards, and compliance, enhancing its ability to bid for more advantageous contracts with customers that require such things.



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5. Technology Stack and Skills Required

Technology	Name	Version
Database	Microsoft SQL Server	12.0.5026
Reasoning		
Existing Internal Tools have recently been ported to Microsoft SQL Server from Microsoft Access.		
Technology	Name	Version
Database Management Program	Microsoft SQL Server Management Studio	2018
Reasoning		
The standard way to interact with SQL Server since our IDE's version doesn't have good database interaction.		
Technology	Name	Version
IDE	Microsoft Visual Studio	2010
Reasoning		
Though we have access to and develop in Microsoft Visual Studio 2019, not every developer has access to this version due to a limited number of licenses.		
Technology	Name	Version
Platform Toolset	MSC	100
Reasoning		
Using a later version would make the project inaccessible to developers who only have Microsoft Visual Studio 2010.		
Technology	Name	Version
Language	C++/CLI	ISO C++14
Reasoning		
Our default development tech-stack utilises C++/CLI in all front-end and most back-end projects. This is due to several factors including internal development history and the ease of integration with both the Windows development workflow and our current tech-stack.		
Technology	Name	Version
Suggested Alternate Language	C#	4.0
Reasoning		
<p>The University is encouraging us to embrace a new language to enhance our front-end development, aiming to modernise our approach. Internally, there has been a slight push for this change in recent years. However, we haven't had a suitable opportunity to integrate a new language into our current tech-stack. This project may be a suitable chance to do so.</p> <p>Among the available options, C# appears to be the most pragmatic choice for integration into our existing tech-stack, causing the least amount of friction. Since the differences in written code and practices between C# and C++/CLI in our preferred front-end framework (Windows Forms) are so small; there may be more reason to use C# over C++/CLI for a front-end application as it would simplify tech-stack of the application.</p>		



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Technology	Name	Version
Framework	.NET Framework	4.0
Reasoning		
.NET Framework is already utilised for the majority of our front-end applications that have been developed in recent years. 4.0 is the latest possible version of .NET Framework that can be developed with in Visual Studio 2010.		
Technology	Name	Version
UI Framework	Windows Forms	4.0
Reasoning		
In recent years, Windows Forms has served as the primary UI framework for most of our front-end applications. It fulfils our requirements effectively and is already seamlessly integrated into our default workflow. Therefore, introducing a different UI framework to our tech stack, which would require learning and potentially cause friction and tedium during development, appears unnecessary.		
Technology	Name	Version
Libraries	Tascomp Internal	V11
Reasoning		
There may be the possibility that we have to utilise our internal libraries. If this is the case, our current tech-stack and workflow would seamlessly accommodate this. As usual, there shouldn't be any need for any external libraries.		
Technology	Name	Version
Character Set	Microsoft Multibyte	~
Reasoning		
Compatibility and parity with internal libraries and any future integration with external databases or programs will require the use of Microsoft Multibyte over Unicode. At its core, this requirement is due to the differences of buffer sizes between the two character-sets.		
Technology	Name	Version
Source Control	Microsoft Source Safe	6.0
Reasoning		
Existing source control solution. Storing and backing up to the same source control solution that the rest of the company's codebase is already would be the most pragmatic choice.		



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6. Project Development Process

Tascomp adheres to a rigorous protocol for software development, encompassing the entire life cycle of a project. While the subsequent flow charts illustrate a traditional iterative approach, there exists a distinct sub-process that has been progressively taking shape within the software team, specifically related to the software writing aspect. This particular project will adopt that sub-process.

The aforementioned evolving sub-process, primarily focused on software composition, could be labelled as an agile methodology, although it is not explicitly defined as such. It consists of weekly software meetings each Tuesday, where the prior week's deliverables, along with their completion status and particulars, are evaluated. The ensuing week's deliverables are then proposed by the developer, informing their colleagues as well as the product owner about their intended tasks for the upcoming week. The significance and priority of these prospective deliverables may be negotiated, or their necessity questioned, but in most instances, they are approved as they are.

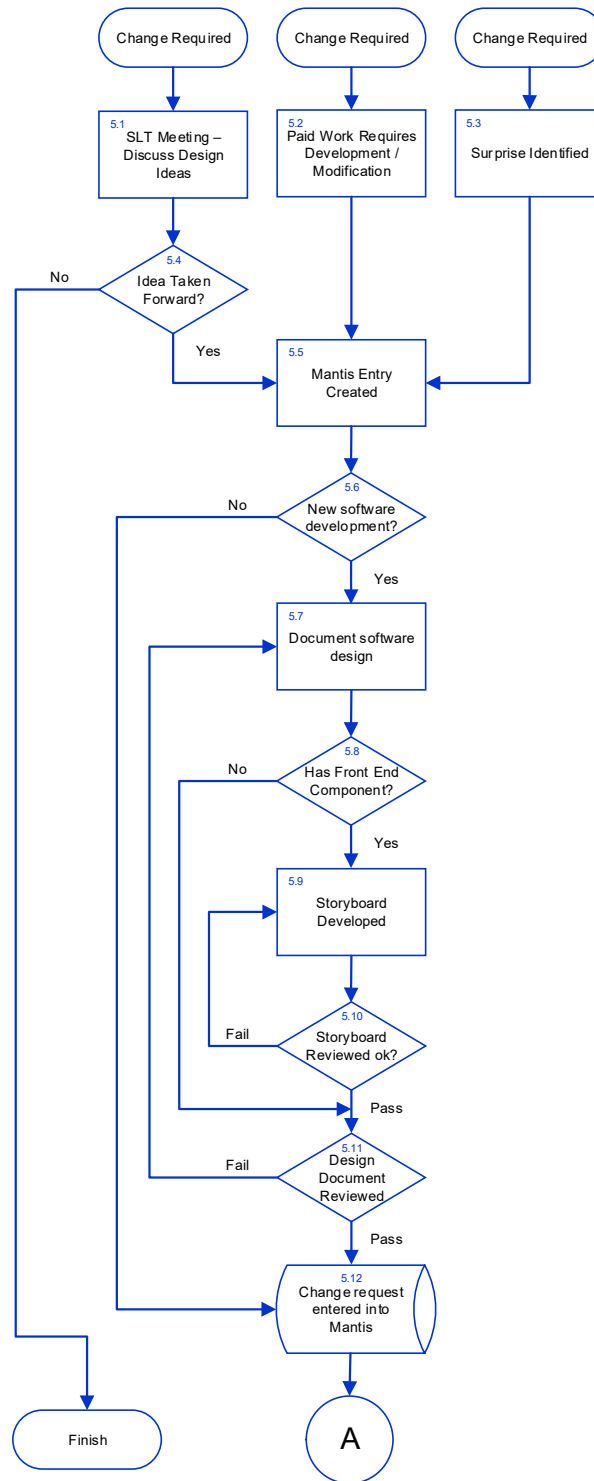
Conventionally, Tascomp's Software team assigns a single developer to a project from inception to completion, with other developers possibly contributing to or modifying the software beyond the scope of the original project. In contrast, the Support Tracker project will involve two developers. Once all deliverables have been fragmented into manageable tasks and allocated to each developer, objectives and milestones can be clearly defined, thereby enabling a more precise estimation of the project timeframe.

While the weekly software meetings are not formally categorised as aligning with the sprint-scrum style of agile development, they do bear a close resemblance. So much so, that the typical roles found in the sprint-scrum style of agile development could easily be identified.

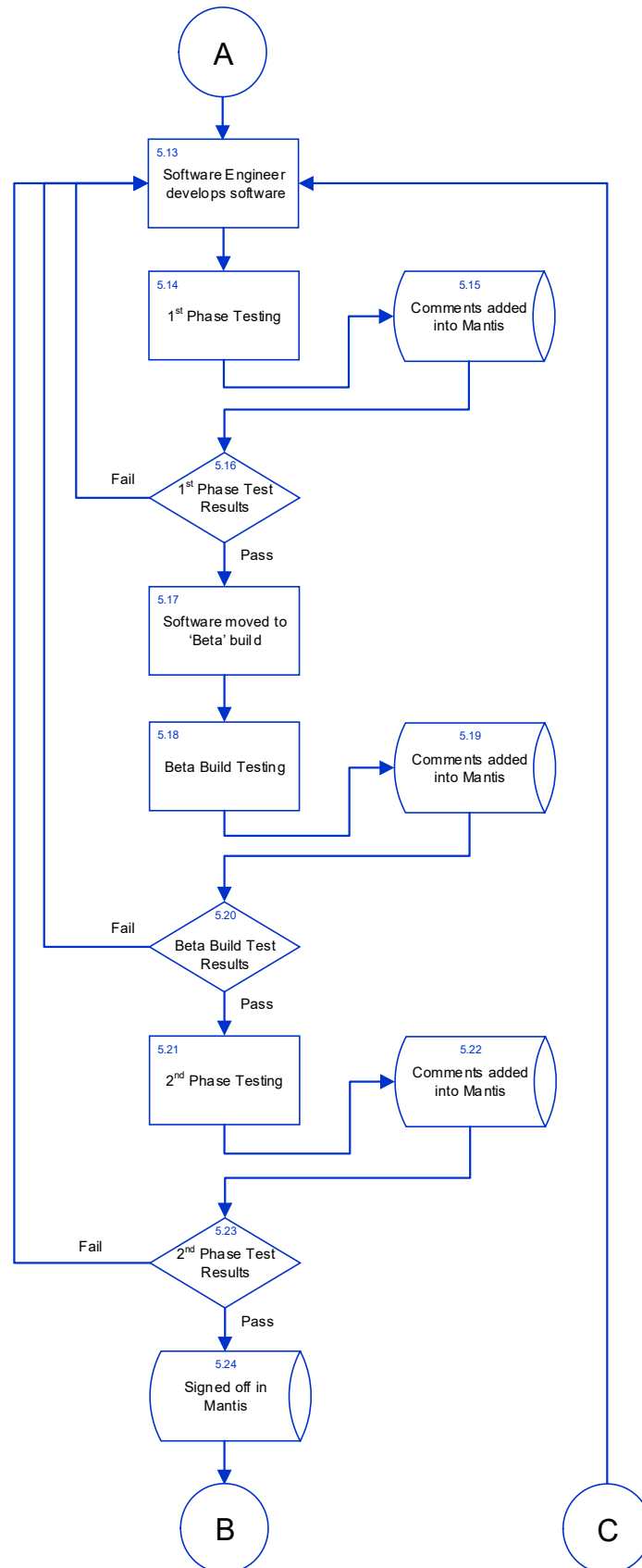
Product Owner
Alan Williamson
Primary Scrum Master
Alan Williamson
Secondary Scrum Master
Steven Tilly
Project Developers
Shaun Broomfield
Tom Atkinson



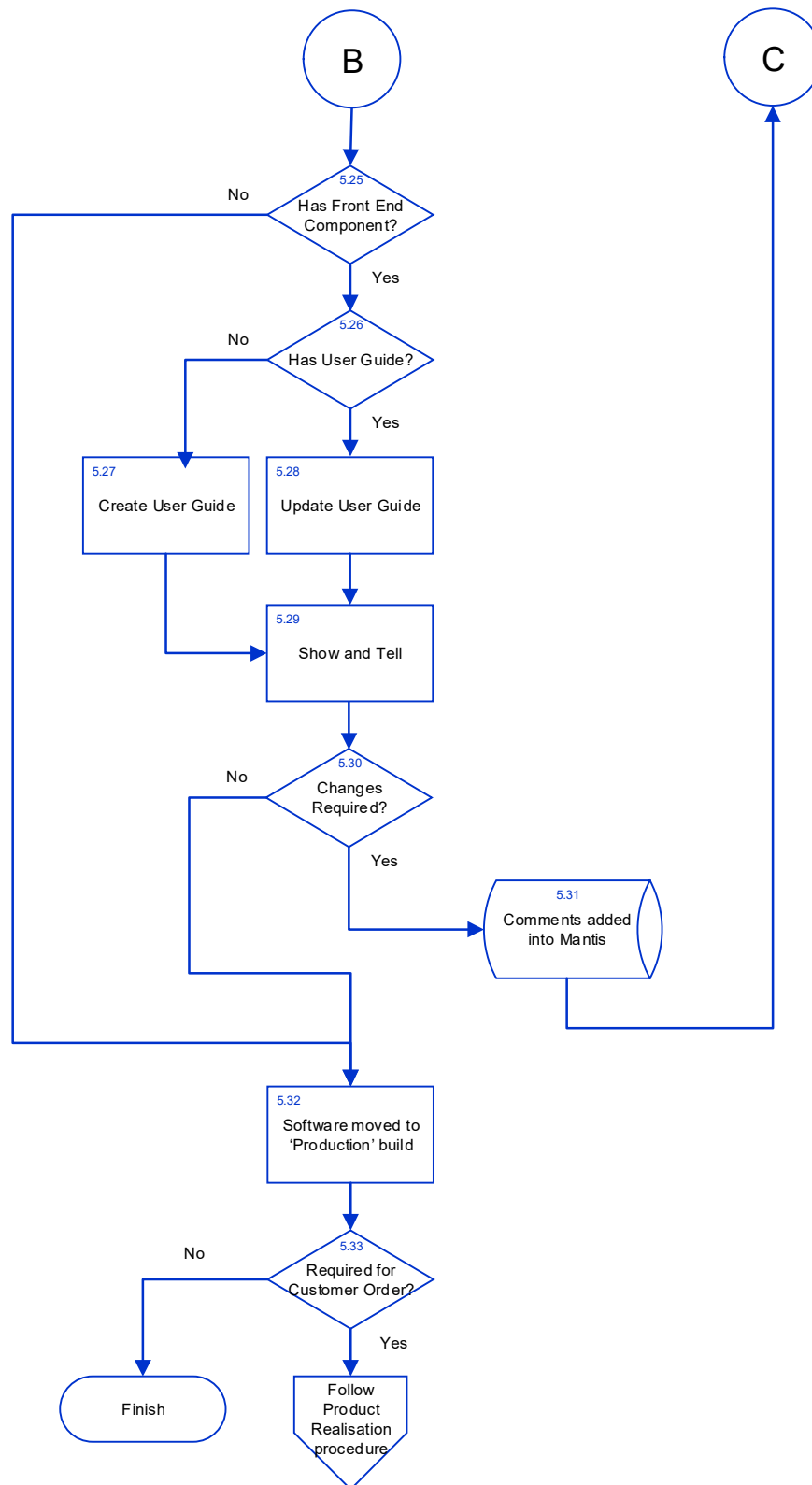
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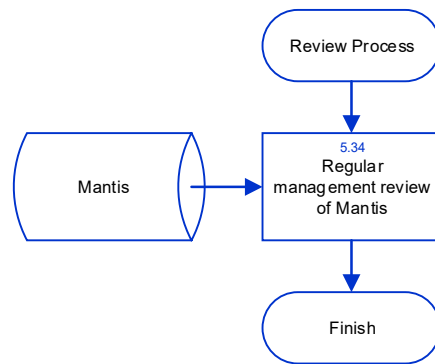
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7. Costing Acknowledgements

Todo

Hourly Rate

- Workplace annual overhead
 - Building
 - Lease/Mortgage
 - Ground Rent
 - Site Service Charge
 - Business P...
 - Utilities
 - Administration
 - Equipment
 - Hardware
 - Licensing
 - Shipping
 - Customs
- Wages
 - National Insurance
 - Pension
 - Accountancy



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8. Constraints

In order to ensure the successful development and implementation of our new internal ticketing system, it is crucial to consider various project constraints. These constraints encompass both technical and ethical aspects, which play significant roles in shaping the overall project strategy.

8.1 Accounting for Scalability and Integration Challenges in Further Development

Further development beyond the initial scope of this project is critical to its effectiveness and justifying its existence. A key hurdle to meeting this, expanding the scope of our ticketing system, post its initial scope and build, is successfully merging it with several existing internal tools.

These tools currently operate as independent data islands, with their databases lacking a standardised, interconnected structure. Some of the older tools don't adhere to normalised database schemas, or are only partially normalised, which only complicates the integration process further.

To successfully integrate our ticketing system with these distinct data islands, especially those with non-normalised schemas, we must navigate a few challenges and take the following steps:

- **Detailed Analysis:** Carry out a comprehensive review of each relevant internal tool's database structure. Older tools with non-normalised schemas will need particular attention. Try to identify any existing data relationships, even if they're not immediately obvious or structured.
- **Standardisation Initiatives:** Despite the challenge of non-normalised schemas, aim to establish a standardised data model that can serve as a mutual language between the internal tools. This model should include the core entities needed for integrating the ticketing system, such as tickets, interactions, customers, systems, contacts, and associated data. Adjust the data model to accommodate any quirks found in the older tools.
- **Data Mapping and Adjustment:** Create a strong data mapping and adjustment procedure that considers the differences in schema structures. This may involve changing non-normalised data into a standardised format that's suitable for integration. Techniques like Extract, Transform, Load (ETL) processes could be used to bridge the gap between the non-normalised schemas and the standardised data model.
- **Data Cleaning and Validation:** Establish data cleaning and validation processes to ensure the integrated data's reliability and uniformity. As part of this process, tackle any data quality issues resulting from the non-normalised schemas, such as duplication, inconsistency, or missing values. This could be particularly relevant for



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areas like Customers, Sites, and Contacts, as well as for tools like Support Manager, Customer Portal, and Mantis.

- **Iterative Approach:** Accept that integrating with non-normalised schemas may require an iterative approach. Start with smaller, incremental integration efforts to test the data mappings and transformations.
- **Further Development:** Expect that further development and continual maintenance will be necessary to accommodate changes in the older internal tools. As these tools evolve or undergo updates, the integration mechanisms and data mappings might need adjusting to keep the workflow smooth.

It's of paramount importance to evaluate the structure and utilisation of the datasets from each relevant internal tool, as well as understand how their corresponding front-end applications interact with the data. Such a process will provide key insights that will inform the initial structure and planned usage of the dataset for this proposed project.

By doing so, we ensure that this project is not a futile exercise, as it significantly boosts its potential effectiveness, leading to a substantial enhancement of our existing support processes. Moreover, it facilitates a smoother integration with Tascomp's current internal systems and operations.

8.2 Ethical Considerations and Compliance

A key constraint we must keep in mind during the development of our ticketing system is the need to follow ethical guidelines and relevant regulations. Being based in the UK, there are particular ethical factors we must take into account:

- **Data Protection and Privacy:** Considering that the ticketing system will likely handle sensitive and personal data pertaining to customers, their site systems, and their support interactions, it is of utmost importance that we adhere to the regulations set forth by the General Data Protection Regulation (GDPR) and any other relevant data protection laws applicable in the UK. This ensures the proper safeguarding of customer's privacy and data integrity.
- **Equitable and Unbiased Treatment:** We must design and implement our ticketing system to promote equity and prevent any form of discrimination. Any algorithms or decision-making processes used within the system need to be transparent, explainable, and free from biases linked to race, gender, age, or any other protected characteristic.
- **Confidentiality and Security:** Safeguarding the confidentiality and security of data within the ticketing system holds paramount importance. To mitigate the risks of data leaks and potential breaches of Non-Disclosure Agreements (NDAs), a crucial step is to employ encryption techniques to protect the database.
- **Accessibility and Inclusivity:** It's crucial that we design and develop our ticketing system with accessibility in mind, making sure it's usable by people with disabilities. We need to think about offering alternative means of access for users with varying abilities or needs.

