PAINS AND GAINS IN SOFTWARE DEVELOPMENT – FROM POC TO MARKET

Reshma Rajput, Ephicacy Lifescience Analytics
Charan Kumar Kuyyamudira Janardhana, Ephicacy Lifescience Analytics

ABSTRACT:

Software development in clinical domain has its challenges in developing products and deploying new technologies. The challenges could be internal such as hiring, training, managing internal expectations within the development, testing and related teams. Also, challenges could be external such as meeting customer expectations.

During the Proof of Concept (PoC) phase of a project, extensive demonstrations of the product and technologies used are presented to prospective clients. Major issue here is aligning the product knowledge with prospective clients who have very less knowledge of the use cases of the product and in few cases, the domain too, and business takes priority weakening the stance of technological value addition in the long run post implementation. Another momentous challenge is lack of enough documentation during the different phases of the project, from PoC to deployment. This could be at either the Client or the Supplier end or both, impacting the current and future releases of the project.

Hiring and training are crucial factors in resolving the workforce related challenges within an organization. All internal functions need to comprehend the relevance of having adequate documentation for User Requirements, User Stories, Trace Matrix, various plans like Project Plan, Implementation Plan, Risk & Mitigation Plan, Migration Plan etc. The Client also needs to emphasize the gravity of documentation. This would pave the building blocks for a successful project and a delighted customer. This paper will share insights on addressing these challenges in an amicable manner meeting the needs of both internal employees and the customers.

INTRODUCTION

There are lot of products in clinical and healthcare domain today. Customers have options to choose from, due to the number of products available in the market. An organization might have quite a few customers using their product(s). But a lot goes into acquiring and retaining those customers because the product is evolving, and it is important to know the pain points of the customer, their needs and addressing these in the right way.

The scope of this paper is to highlight most of the challenges faced by an organization in selling the product and issues that can emerge post product implementation. At various stages during the software development and PoC, the challenges can be overcome, and issues can be resolved by applying right management techniques. Well-known steps in new product development are:

1. **New Product Strategy** – Innovators have clearly defined their goals and objectives for the new product.
2. **Idea Generation** – Collective brainstorming through internal and external sources.
3. **Screening** – Condense the number of brainstormed ideas.
4. **Concept Testing** – Structure an idea into a detailed concept.
5. **Business Analysis** – Understand the cost and profits of the new product and determining if they meet company objectives.
6. **Product Development** – Developing the product.
7. **Market Testing** – Marketing mix is tested through a trial run of the product.
8. **Commercialization** – Introducing the product to the public

We also have the BAH model which talks about the seven steps - The seven steps of BAH model is: new product strategy, idea generation, screening and evaluation, business analysis, development, testing, and commercialization.

Currently, the lean startup methodology is in vogue seeking to eliminate wasteful practices and increase value-producing practices during the earliest phases of a company so that the company can have a better chance of success without requiring large amounts of outside funding, elaborate business plans, or a perfect product. Customer feedback during the development of products or services is integral to the lean startup process and ensures that the company does not invest time designing features or services that consumers do not want. This is done primarily through two processes, using key performance indicators and a continuous deployment process.

THE START

A product development company faces numerous challenges, both internal and external during the phases of software product development. It is crucial for all the stakeholders to be aware of the business values and aspects of the product being developed. In most cases, developers do not understand the business value behind certain use cases or modules of the product being developed. Training the development and QA team on the domain and ensuring they understand the business value is crucial. Hiring and retaining employees is also important as the organization has invested in them.

Project documentation like User Requirements, User Stories, Traceability documentation, various plans like Project Plan, Implementation Plan, Risk & Mitigation Plan, Migration Plan etc. in the software development of the product plays a vital role.

Also, during PoC phase of the project where extensive product demonstrations are delivered to potential customers, it is important to ensure the target audience has adequate background of the domain and understand, map their business needs with the product and its capabilities to sustain in the market. In most cases the top management is involved in the initial product demos and later the team who will use the product is involved in the PoC phase. Hence there could be some misalignment and difference of opinions.

BUILDING A TEAM:

Team building in a product development perspective is the most important phase. Developers, testers, product/project design team – all have to be carefully handpicked who can guide, mentor the rest. The software knowledge is universally accepted requirement. However, what sets apart is the domain understanding – be it clinical, banking, hiring etc. This is important since the intricacies of understanding and translating customer requirements into a graphical user interface which is user-friendly will be the key in customer satisfaction.

Training the team on domain aspects, the regulatory requirements, the entire product lifecycle, importance of the product in the domain cycle – all these form an extremely important part of team building exercise irrespective of the methodology used for development – be it Agile or waterfall model.

PRODUCT DEMONSTRATION:

The organization offering products and solutions to prospective clients showcase their product through demonstrations. The product demonstrations happen at various stages – from initial demonstration where a client is transformed into a prospective one. During PoC phase – where the Client would understand the various capabilities and product offerings through multiple demo sessions. Once the customer signs an agreement and is onboarded, that is when multiple teams of the customer using the product will be trained on the product. Initial Product demonstrations could be delivered in person at customer locations or remotely.

During the product demonstrations, the customer could request for some additional enhancements or product features based on their requirements. The product company could have the features or enhancements rolled out in the future releases of the product. There could also be gaps in the requirements, meaning what is missing in the product currently based on the customer needs or a feature that currently

does not fulfill customer requirements.

STEPS INVOLVED AND DOCUMENTATION REQUIREMENT:

Once the customer is onboarded and understands the product and its features and how it meets their requirements, a project plan is created for the product's Initial Release. Both the customer and the supplier could have their individual plans, but it is important to keep them synchronized. The Project plans could also be merged at some point. Both the parties must ensure to send an updated project plan frequently. This could be done at regular intervals. Also, frequent weekly meetings or scrum calls are required to ensure the timelines are met and any risks are duly communicated upfront.

The prospective customer will share a requirements document with the product company. This is the most crucial step in the lifecycle. The supplier creates a detailed requirements specification based on the set of requirements received from the customer. A set of meetings are conducted internally to understand the requirements and propose solutions, timelines and estimates for the requirements as well as the gaps. An Impact Analysis is done thoroughly to understand the impact of the changes that would be made to the product and thus an Impact analysis sheet is prepared which is signed internally and also signed off by the customer after review. The Requirements Specification is usually a word document and the Impact Analysis is an excel file.

An internal tracker sheet is also maintained by the supplier to track all the details relevant to the project. It could have multiple tabs that include the requirements, environment details (DEV, TEST, UAT etc.), user credentials, Gaps, Comments etc.

Different product companies could follow different methodologies or adopt different frameworks and tweak them as per their needs and what best suits them. The following section briefly describes the various documents and their content.

USER REQUIREMENTS:

As mentioned above the initial set of user requirements is sent by the customer. This document could be in word or excel format. The Business Analyst at the supplier end then prepares a Requirements Specification document in detail mapping the customer requirements to the Product features.

Various scenarios are then created with the user requirements as input. There could be one scenario per use case or module.

Specific customer requirement can map to one or multiple requirements. A requirement also maps to product feature(s). It is usually a good practice to have the requirement defined in short words, keeping it simple and map to just one feature or requirement. There are several tools where such requirements can be documented like Jira, Target Process etc. The requirements are usually documented by the product development team, but other teams such as quality testing team or Business analyst team can also document the requirements.

TRACKING DOCUMENT:

Normally, the activities are tracked in excel format that tracks various developments and other information related to a project. It can have the customer requirements, issues raised by the customer, gaps in the product, the environment details of the product – DEV, TEST, UAT etc. A tracking document also has user credentials for easy access. Action Items could be recorded. The high-level training plan for customer could also be included in this document, if required. This document could have data related to the following recorded:

Requirements	Gaps	Customer queries	Issues	Links	Users	Training plan

PROJECT PLAN:

A project plan depicts the overall planning of a project and is usually a Microsoft Project Document. A typical Project plan has 4 stages Initiation, Planning, Validation and Go-Live and could have different subset of tasks for different teams. For example, there could be a section for Business Analysis, Development, Quality Assurance and their respective tasks are listed along with start and end dates and the resources responsible for the tasks.

One who needs to update a Project plan needs to have a license to MS Project. If someone only needs to view the plan, they can do so with several tools like Seavus viewer or a PDF file can be generated from the MS Project document for viewing.

Tasks related to the following can be captured here:

Initiation & planning include scope of the project

Instantiation

Validation

Go-live

IMPLEMENTATION PLAN:

An Implementation plan is usually a document that explains how the project will be implemented. It could be a Solution Implementation Plan or even an approach document on how to implement a solution for a requirement. An Approach document is a word document that is usually created by a developer working on a requirement specification. A Solution Implementation Plan is created by the Business Analysis team and this is quite an elaborate document about the overall Project. It has details of project, the description of the Solution, the timelines, Risks and Mitigations, list of all the Stakeholders, Training etc.

RISK & MITIGATION PLAN

The Risk & Mitigation plan could be a simple document highlighting the risks that can occur during the project and the respective mitigations. A detailed Risk register is also created by the development team.

MIGRATION PLAN

The Migration plan is created if there is some customer data to be migrated in the scope of the current project. It has details of what is included in the Migration i.e., the scope, how it's done, and the person involved in doing the migration will usually create this document. He/She could be a developer writing the Migration code.

These are the minimum documentation requirements which play a major role in capturing key aspects related to product development.

INTERNAL READINESS:

An organization needs to be transparent in its core values. Ensuring that the same information is passed to all stakeholders and all of them understand the business aspects and business values of all the use cases of the product.

Training all the teams involved in product development and PoC phases of the product.

Retaining employees is also important as they know the product better than hiring and investing in their training. Also, hiring new and bright talent from the market should also be considered as they would bring immense domain knowledge.

Close attention should be paid to the internal expectations of team members and the organization should also invest in their growth thus retaining talent.

It is also crucial to understand the pain points of existing customers. Also understanding the expectations of existing and potential customers and working towards meeting their requirements ensures delighted and

satisfied customers.

Paying close attention to all kinds of project documentations in all phases of the product development is also important. It is also crucial to make the customer understand the importance of such documentations as a lot of these documents require customer inputs and the customer would also prepare some of these documents.

THE SHIFT: PROJECT DRIVEN MINDSET TO CUSTOMER DRIVEN MINDSET

The design proposals should be based on fundamental understanding of customers' experiences on top of internal business requirements with an eye on global regulatory framework too.

The user experience research methodologies could include:

· Internal interviews with stakeholders, domain experts, and customer-facing employees

· Interviews with customers to prioritize and gain insight into user challenges and needs

· Validating findings with internal stakeholders and customers

· Designing and iterating on prototypes through diagnostic evaluation

· Development of the agreed-upon solution

The crucial step is to involve internal stakeholders, domain experts, and customer-facing business analysts as early as possible. Interacting/interviewing them to learn what they perceive as key customer challenges and to gain a comprehensive understanding of their expectations for the product. These internal perspectives also help formulate and draw specific product requirements, providing inputs to further steps of research: customer surveys and interviews.

CONCLUSION

The following key points are important in ensuring a successful product roll-out.

1. Engaging stakeholders early on to help navigate around any obstacles that could otherwise block your progress.

2. Build strong partnerships with domain experts and customer-facing business analysts so that there are resources for product expertise as well as customer involvement.

3. Encourage stakeholders' participation at every turn and involve them in non-traditional design workshops. This might increase the number of viable solutions and makes stakeholders aware of potential problems before they arise.

4. Communicating and demonstrating design features to stakeholders so they are aware of the progress and can get involved in the process.

5. Continuous validation – It is important to continuously validate the design direction throughout the process.

Balancing the priorities of internal and external stakeholders is of utmost importance. Internal stakeholders include business development, product management, software development, and more. Each group has their own priorities and areas of focus. And while customers are ultimately everyone's top priority, the needs of the users with any other important requirements need to be considered when evaluating the next feature addition or upgrade.
It is of primary importance to strike a balance between accommodating our internal stakeholders' priorities and creating the best possible experience for customers should be the goal in any product development lifecycle.

REFERENCES

https://en.wikipedia.org/

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CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

Reshma Rajput
Ephicacy Lifescience Analytics Pvt. Ltd.
reshma.rajput@ephicacy.in
reshrajput09@gmail.com

Charan Kumar
Ephicacy Lifescience Analytics Pvt. Ltd.
charan.kumar@ephicacy.in
charan.kumar.kj@gmail.com