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CRITICAL ROLES IN BALANCING CUSTOMER EXPECTATIONS AND SOFTWARE PRODUCT DEVELOPMENT

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Abstract: *The disparity between customer expectations and software development methodologies is a prevalent challenge. This exploratory study capitalizes the authors' practical and theoretical expertise, to underscore the necessity of investigating the critical roles essential for balancing customer expectations and software development based on Agile methodology within the context of organizational agility, as reflected in the literature review. The results of this study shed a light on the complexities of product development, allowing organizations to increase business organizational agility while balancing developing software and product customer expectations.*

Key words: *Agile, organizational agility, roles, PMP, Project management, software PM, Customer Centricity*

1. INTRODUCTION

The development of software products presents a challenging endeavor that extends beyond technical intricacies and the utilization of specialized tools, which demand a profound level of technical expertise. A critical aspect of this challenge lies in the software's fundamental purpose: addressing the specific business needs of clients.

Process development is considered a complex one unfolds as a two-fold narrative encompassing the customer's needs, requirements, and expectations, juxtaposed with the project team representing the software company, each possessing their unique approach to conducting business.

This exploratory paper aims to investigate the complexities of this multifaceted dynamic, with a specific focus on the critical roles required to balance client expectations and product development within software development teams and software companies.

The research our objective is to gain a comprehensive understanding of the intricacies involved in developing and delivering software products that align with client expectations.

2. CUSTOMER EXPECTATIONS

In an ever-evolving market landscape, the need for fresh and versatile approaches is paramount, with digitalization frequently emerging as a straightforward and evident solution. Incorporating greater business agility through the utilization of digital tools for customer engagement forms an integral component of an organization's business development strategy. Nevertheless, the mere implementation and operation of these tools represent only the initial phase of this journey.

According to their unique applications, software packages are divided into three groups by Jorgenson's classification scheme [1]:

(1) Predefined software;

(2) Custom software;

(3) Dedicated software.

Within this framework, custom software relates to software elements that have been preexisting but are adapted or modified to align with the specific demands of a particular business request. On the other hand, dedicated software represents an entirely distinctive category, comprising software products meticulously crafted solely for the exclusive use of a particular client or organization.

When seen from a business standpoint, the creation of specialized software indicates a bold move meant to advance the company. This endeavor often materializes after a thorough business analysis, which may be independently conducted by the organization itself or carried out in collaboration with external consultants. This analytical endeavor unfolds within an environment marked by a prevailing atmosphere of uncertainty.

An in-depth analysis reveals the strategic implications of these software categories in terms of business agility [2]. Predefined software typically offers readily available solutions, providing a degree of agility in terms of rapid deployment and cost efficiency. Custom software, meanwhile, affords businesses the flexibility to adapt existing software to meet specific needs, enhancing agility in catering to unique customer demands.

However, the most intriguing facet from a business agility perspective lies in the domain of dedicated software. Crafting the entire customized software solutions, although filled with uncertainties and complexities, exemplifies a forward-thinking approach to addressing unique business challenges.

This approach underscores an organization's willingness to invest in innovation and adaptability, showcasing a proactive stance in navigating evolving market dynamics. In essence, the strategic deployment of dedicated software represents a bold commitment to business agility, as it aligns technology solutions with the precise contours of an organization's vision and needs, facilitating rapid responses to emerging opportunities and challenges.

In the domain of digital transformation, clients are sometimes confronted with a knowledge deficit, making it challenging for them to grasp the full spectrum of possibilities and advantages this transformative process offers. Consequently, organizations must recognize this informational gap as a critical milestone in the digitalization journey, with substantial implications for business agility. In such scenarios, addressing this knowledge shortfall becomes a strategic imperative, demanding a judicious allocation of resources for consultancy services or dedicated efforts aimed at seizing digitalization opportunities.

This knowledge gap not only poses a challenge but also carries significant implications for business agility. Organizations that proactively invest in consultancy services to educate their customers on digitalization's potential stand to gain a competitive edge.

By doing so, they facilitate clients in making informed decisions, aligning their strategies with digitalization initiatives, and adapting swiftly to the ever-changing business landscape. However, it is crucial to recognize that this investment, while fostering agility through enhanced knowledge, requires a nuanced understanding of individual client needs and a prudent allocation of resources to ensure the seamless integration of digitalization endeavors with broader business objectives.

3. OVERVIEW OF THE SOFTWARE DEVELOPMENT PROCESS

The aim of software product management is to maintain market leadership and extend product life as much as feasible with minimal costs to optimize profitability. In software firms, product management duties are essential because they facilitate decision-making and the creation of worthwhile products. A software product's definition, introduction, development, growth, maintenance, and withdrawal from the market are all part of the software product management process. It has tight ties to other software engineering disciplines including business analysis, requirements engineering, agile software development, project management, and strategy and agile development.

In addition, the process of developing a software product is situated within a project framework that includes a dedicated team and a defined execution methodology. Project team will look to understand the business context and propose the right technology and approach to develop the product and the project methodology will provide processes, tools [3] and right teams roles to transform customer requirements into software product [4].

Traditional project management methodologies, known as (waterfall model or methodology) methodologies [5] define four project phases of the project: initiation, design

and plan, execution, and closure for entire project lifecycle. Those methodologies describe a sequential development approach of the product, the critical aspect of the waterfall methodology is how to define, at the beginning of the project, the scope of the project to cover all the client's requirements and to deliver the results in time and budget as was agreed.

Furthermore, the project itself, any project, is unique following project definition [6] and for each of the project there are initial assumptions taken being considered unchanged. In fact, all the actions defined in the projects are done considering those assumptions. This is one of the reasons why in a dynamic environment some projects fail.

Agile methodologies provide a context where the customer is the only important person in the room. The Agile values [7] underline the importance of customer collaboration and continuum interaction in the project and with the stakeholders [8]. All team members are encouraged to contribute when providing value for the client; this approach establishes a high level of ownership, encourages innovation, and embraces change.

From a business agility perspective, it is imperative to recognize that fostering an environment where all team members are encouraged to contribute to providing value for the client serves as a foundational element in promoting organizational agility. This approach not only establishes a high level of ownership and accountability among team members but also cultivates a culture of innovation and adaptability.

Embracing change becomes an inherent aspect of the organizational ethos, as team members collectively contribute their insights and expertise to meet evolving client needs and market dynamics.

On the other hand, Agile, as a defined methodology, is merely a framework that suggests some organizational structure for project implementation, but the crucial component is the shift in perspective toward teamwork, knowledge sharing, proactivity, and a path of continuous learning. In an intriguing analysis, a team of researchers from the University of Sydney [9] drew a spectrum of Agile perspectives from several angles as: Avid Agile, Inclusive Agile, and Paradigmatic Agile after completing a thorough review of 788 documents, 100 of which were from most recent publications.

All these arguments highlight the necessity of adopting multiple perspectives, and the authors are inviting readers to utilize them as lenses through which to view the perspectives of various organizations as they apply Agile. Incorporating Agile methodology principles into the broader context of business agility entails recognizing that understanding the organization serves as a pivotal starting point.

This comprehension serves as a foundation for defining and implementing a comprehensive business perspective aimed at effectively addressing customer needs through the orchestration of projects and the alignment of supporting business processes. This notion [10] underscores the significance of organizational awareness as a fundamental precursor to cultivating a holistic approach that not only integrates Agile practices but also optimally responds to evolving customer requirements within a dynamic operational framework.

A commitment to adaptability and customer-centricity across the entire organization is necessary for the integration of Agile concepts into business agility. Businesses can increase their transversal ability to quickly deliver customer value by adopting Agile principles including iterative development, collaboration, and responsiveness to change.

Agile orientation extends beyond project-level agility, permeating the broader ecosystem of business processes that underpin these projects. It underscores the importance of aligning internal operations with external customer needs, leveraging Agile practices to streamline processes, minimize waste, and facilitate continuous improvement [11].

In the context of product development, the integration of Agile methodology principles into the realm of business agility represents a powerful synergy. It acknowledges that a comprehensive understanding of the organization's intricacies is the linchpin for aligning product development efforts with the

ever-evolving needs and expectations of customers.

By grounding product development initiatives in Agile principles, organizations can foster a culture of adaptability, collaboration, and rapid responsiveness to customer feedback.

From an academic perspective, this synthesis underscores that business agility, when applied to product development, necessitates an astute consideration of both Agile methodologies and the broader organizational context [12]. This holistic approach enables organizations to not only expedite the delivery of innovative products but also ensure that these products precisely meet customer requirements.

In summary, the amalgamation of Agile methodology principles with business agility in the domain of product development symbolizes a dynamic shift in how organizations approach the creation and delivery of value to customers. It emphasizes the importance of understanding the organization as the pivotal starting point for orchestrating agile product development processes that are not only efficient and adaptive but also finely attuned to customer needs, thereby paving the way for sustainable competitive advantage in today's rapidly changing business landscape.

4. ANALYSIS OF THE CRITICAL ROLES

In the context of organizational agility and product development, three key ideas emerge, each highlighting the explicit tension between the product development team, the level of business agility, and customer expectations:

- Traditional and Agile approaches in conflict: while traditional methodologies emphasize a sequential development approach with well-defined project scopes, Agile methodologies prioritize customer collaboration, flexibility, and continuous interaction. This conflict underscores the challenge of balancing established project management practices with the need for agility in responding to evolving customer expectations.
- Shift towards customer - centricity and collaboration: The principles of agility emphasize the value of customer collaboration and encourage all team members to add value for the client. This approach fosters a high level of ownership, innovation, and adaptability, aligning with the principles of organizational agility. It emphasizes that addressing customer needs is paramount in achieving agility in an organizational context as well.
- Integration of Agile principles into business agility: It involves understanding the organization as a starting point and aligning projects and supporting business processes with customer needs. This holistic approach recognizes that agility in the organizational context extends beyond project-level practices to permeate the entire organizational ecosystem. [13]. It emphasizes the importance of aligning internal operations with external customer needs, facilitating continuous improvement, and delivering products precisely tailored to customer requirements.

From these descriptions, it becomes evident that the customer and the software development team operate within two distinct realms, each harboring distinct expectations and employing dissimilar approaches. This divergence in perspective and approach, when viewed through the lens of business agility, can unveil potential hidden barriers that impede the team's agility.

In the context of business agility, this disparity in expectations and methodologies between the customer and the software team introduces a nuanced challenge. It underscores the importance of fostering effective communication and alignment between these divergent worlds. Failure to bridge this gap can manifest as a concealed impediment to achieving agility within the team [14].

When the customer's expectations and the team's approaches remain at odds, it can lead to misalignment, rework, and delays, hindering the team's ability to respond swiftly to changing market conditions or customer needs.

Furthermore, this inherent disconnect can also have broader implications for the team's adaptability and responsiveness, key tenets of business agility. By recognizing and proactively addressing these hidden barriers, organizations can enhance their agility by facilitating a shared understanding, reducing friction, and fostering a

collaborative environment where both the customer and the software teamwork in harmony towards achieving common goals.

In the pursuit of organizational agility, the proactive recognition and mitigation of hidden barriers are instrumental in facilitating a shared understanding and reducing friction within the operational environment.

A pivotal component of this agile transformation lies in the cultivation of a collaborative environment wherein the symbiotic relationship between the customer and the software development team flourishes, merging around the attainment of shared objectives.

Regardless of the project methodology employed, whether traditional or Agile, specific roles are assigned to address the project's needs, each aligned with the respective methodology philosophy. Using the analysis done previously [15] for the role of project's team we select two differences between traditional methodologies and Agile that encapsulate critical aspects in the dynamic of a project.

For projects prioritizing a high level of product quality, the traditional development approach may be the preferred choice. In such cases, exceptions hold significant importance, as they can impact both the project budget and product quality. The profile of the roles in the team is shaped not only by role descriptions but also by the company's profile and industry as well.

Considering these aspects, we cand delineate four areas of role influences within the company, defined by the specific responsibilities these roles bear in relation to four major stakeholders: top management, project team, the company and the client.

As an illustration in Figure 1 we use the case of Product Owner – from Agile methodology - who is part of the development team and his role is to understand customer needs an expectation and translate it into backlog items for development team, serving as the customer's voice within the development team, acts as a conduit between business stakeholders and the development team, translates the client requirements into actionable directives for the team.

The Product Manager would be the one who integrates the team perspective into a broader view of a company product, adjusting the product's vision and company strategy.

In the pursuit of organizational agility, other critical roles emerge as cornerstones in this endeavor, each contributing uniquely to the overarching goal of enhancing agility and ensuring an adequate response to client needs: Business analyst, DevOps engineer, Agile coach/ SCRUM Master, and so on.

Using these four coordinates to analyze project/ company roles, based on role description, we can have a snapshot of how the organization envisage each of the roles involved in the execution of the directed tasks.

Based on the framework of the roles in a project team provided as the State of the art in Agile methodology, actual practices in software companies reveal that in fact there are several alterations nuanced by appropriate, specific and particular for each software development organization: i.e., to each specific role assigned in a project, several other responsibilities and requests may occur. Add to this the one time only perspective of the client, or any representative company stakeholders, and thus a new complex facet of project or company may reveal. In these light critical roles may be highlighted.

Table 1

Difference between Agile and Traditional project methodologies on the role of project team – extract from [15]

Agile development	Traditional development
[16] Product Ownership is established on the project management level	[16] Manage by exception approach – project manager has a strict budget and all-important changes must be reviewed by board. It takes time and additional effort.
[17] Leadership and collaboration	[17] Command and control

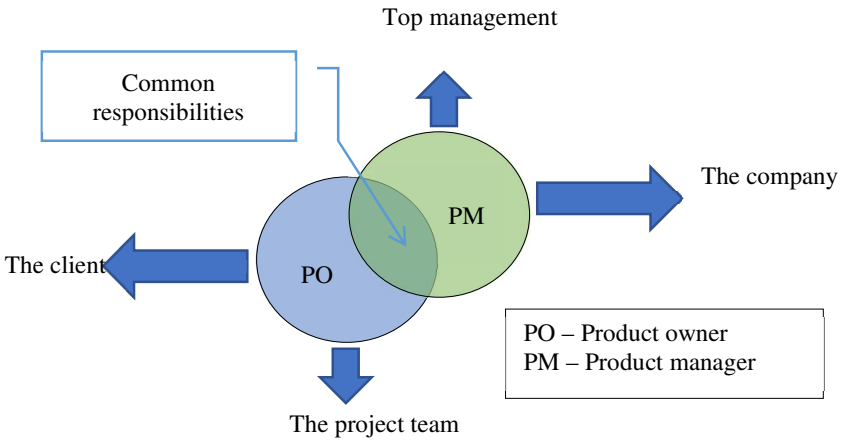

Fig. 1. An example of the PM & PO Agile roles and their influences, [18]

In a nutshell, within the field of agility in organizational context, the identification and cultivation of critical roles assume particular significance when juxtaposed against two distinct project methodologies: Agile and traditional. Across both methodologies, roles cited above take on nuanced dimensions in each context. In Agile, leadership is marked by agility mindset - collaboration, empowerment, adaptability, and customer- centricity. In contrast, the traditional methodologies lean toward a command-and- control structure. In essence, the roles discussed here are dynamic and adaptable, capable of thriving in varying project methodologies. Their significance is underscored by their capacity to shape and align the organization's approach with the chosen methodology.

In customer- centric organization, especially those that are heavily impacted by the digital development [19, 20] (e.g., fintech, e-health, automotive, public authorities), there are dedicated teams build to create a bridge between business and software suppliers. Those teams are built to support development team to faster and better understand the business and customer requirements with the scope of focusing the development team on development only. In these cases, development teams roles are doubled with roles from customer team, interfacing the team with client business.

This strategic alignment not only enhances the organization's adaptability, but also influences the nature of leadership and collaboration within the project.

5. CONCLUSION

In conclusion, the disparities in perspective between customer needs and the product development process are unmistakable. At the project level, methodologies prescribe roles that engage with the client to gather their requirements. The depth of this interaction varies depending on the methodology chosen, a decision often influenced by the software company's unique development agenda. This delineation of roles and the degree of client engagement at the project level are critical factors that impact the alignment of product development efforts with customer expectations. Therefore, selecting the appropriate methodology and defining roles judiciously are pivotal considerations in achieving successful product development projects that effectively address client needs.

The pursuit of agility in the organizational context can, however, run into anticipated impediments, which must be acknowledged. For instance, the rigid adherence to a specific development methodology, driven by the company's agenda, may hinder the organization's ability to swiftly adapt to evolving customer requirements. Moreover, organizational inertia and resistance to change can impede the fluidity of client interaction and responsiveness within the development process.

In essence, while organizational agility remains an aspirational goal, it is subject to constraints imposed by the chosen methodologies and the company's overarching development strategy. Striking a balance between these factors, while fostering a culture that embraces adaptability, presents a multifaceted challenge that organizations must navigate to effectively bridge the gap between customer needs and product development processes.

In summary, the disparities between customer needs and the product development process extend beyond individual projects and permeate the organizational landscape. While companies and methodologies provide overarching descriptions, they often do not adequately highlight the criticality of roles that engage directly with the client.

To bridge this gap effectively, in-depth research becomes imperative. A comprehensive understanding of project perspectives, client interactions, and the impact of development methodologies is essential. Such research endeavors are necessary to unearth insights into the intricacies of product development, enabling organizations to align their strategies with client needs effectively [21-23].

Ultimately, the journey towards harmonizing customer expectations with product development processes is a multifaceted one, requiring a nuanced approach, organizational agility, and a commitment to ongoing research and adaptation.

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Roluri esențiale în echilibrarea tensiunii dintre cerințele clientului și procesul de dezvoltare a produselor digitale.

Dezvoltarea unui produs digital se confruntă adesea cu dificultăți semnificative, generate de discrepanțele dintre așteptările clienților cu privire la rezultatul final și propunerile tehnice ale dezvoltatorilor. Acest studiu exploratoriu valorifică experiențe practice și teoretice ale autorilor, însoțite de temele abordate în literatura de specialitate, pentru a evidenția importanța analizei rolurilor esențiale necesare pentru a echilibra tensiunea dintre aceste cerințe, în contextul agilității organizaționale, și al metodologiei Agile. Rezultatele acestui studiu aduc în prim plan complexitatea procesului de dezvoltare a produselor, și oferă organizațiilor o perspectivă reflexivă asupra utilizării metodelor în contextul agilității organizaționale.

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