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The AEC Product Owner: A New Role Bred Out of the Necessity for Change

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Learning Objectives

- Discover what a product owner is and the importance of the role
- Discover why and how this role is applicable in the AEC industry today, and how it will help shape AEC firms of the future
- Discover when to adopt and implement a product owner at your firm and the benefits of doing so.
- Hear real-world examples of how product owners have driven the success of development projects.

Description

The architecture, engineering, and construction (AEC) industry is going through yet another technological revolution. As cloud technology usage increases, third-party software companies attempt to expand our ability to utilize project data and automate BIM (Building Information Modeling) processes like never before. To assist in pushing the BIM boundaries or bridging the gap between new software and legacy systems, companies are hiring software developers to architect custom software solutions that will forge (pun intended) the future. However, many AEC firms struggle to get the most out of their developers. Establishing the product owner role at your firm can help. This presentation will address the responsibilities and benefits of an AEC product owner. These topics will be discussed from the viewpoints of virtual design and construction (VDC) personnel looking for a new challenge, an acting product owner, and how developers benefit from the role.

Speakers



Justin Lipsey

Passionate about technology and practical applications in the AEC industry, Justin Lipsey is a Project VDC Specialist. In his 5 year tenure with SSOE, he has worked on a wide variety of

projects across multiple industries and delivery methods. With 8 years of experience as a commercial mechanical engineer and 4 years manufacturing mechanical engineer, Justin deeply understands end-user and client needs within the framework of technology. After a year-long rotation with SSOE's VDC department, Justin now provides support, training, and education for users on how to utilize reality capture, BIM 360 and other project technologies. Justin graduated from Owens Community College with an associate's degree in CAD Technology.

Larisa Flory



In utilizing her skills for problem solving, understanding workflows, and seeing the big picture, Larisa has taken on the role of Business Process Specialist. Starting as a Project Management Assistant, Larisa has worked her way up during the last 5 years to a role where she can help drive change and innovation within the company. Having a solid understanding of the AEC project lifecycle and a knack for picking up technology, she can help teams find weak spots in their procedures and developed workflows to create lasting efficiencies. Larisa has worked on a wide variety of projects from creating and owning an internally developed project tracking database to providing support in development of technology plans and their execution. With a Business degree in Operations and Technology Management from the University of Portland, Larisa provides a different perspective on how to do business in the AEC world.

James Malcolm



James Malcolm is a Sr. VDC Technical Leader at SSOE Group, a global project delivery firm for architecture, engineering, and construction management. He has a Bachelor of Science in Computer Science & Engineering from the University of Toledo and over a decade of software engineering experience. Before SSOE, James spent the bulk of his career as a consultant for multiple software consulting companies. He developed solutions for companies small and large, implementing everything from mobile to desktop to web to cloud, internally-facing and externally-facing and everything in between. He led and developed multiple dev teams, including helping his clients build their own teams.

Introduction

The AEC industry is in the midst of yet another technological revolution. Recent world events have shaken our industry to its core and affected every aspect of how design and construction firms operate. The rapid pace at which technology is evolving has required firms to transition to become technology-focused organizations. More than ever, organizations need to be agile and produce creative solutions to complex problems to withstand the disruption brought about by this digital revolution. Re-imagining our technology roles should be one of the primary focuses to assist in pushing the industry forward. This presentation details why the AEC industry should institute a new role, the Product Owner, and how this role can be a driving force behind success for innovative, forward thinking companies. This information will be covered from three different perspectives:

- The Technologist
- The Software Engineer
- The Business Analyst

What is a Product Owner?

In the software industry, custom software solutions are products. Product Owners are accountable for the product. They understand it, market it, and decide on behalf of the stakeholders on how it's developed. The Product Owner also:

- Identify product goals and outcomes
- Working closely with the team during planning and execution
- Owns and communicates the vision and strategy
- Creates and understands product roadmaps
- Develops features and requirements
- Prioritization of product backlog items
- Understanding current product use, jobs to be done, personas, etc. at a deep level
- Helps to break down silos and communication barriers between stakeholders
- Making decisions around design and any required trade-offs related to the technical implementation
- Makes instructional documentation and videos, provides training and support
- Naming and branding
- Defining and tracking metrics
- Optimizing the value of the work the development team performs
- Executive interface

Why the Product Owner Role is a Value Add to the AEC Industry

The Technologist's Perspective

For most design and construction firms, their flagship products are engineering services, construction drawings, and construction management services. But, in recent years, a need for a new product in the form of custom software solutions to empower operations and back-office staff is growing. To support this, many firms have hired software engineers to develop custom software and automations to assist project execution practices and attempt to bridge the gap between BIM and big data. However, there is often a missing link that is needed to truly reap the benefits of software engineer staff and the custom solutions we envision. What is lacking is a role with the duties and responsibilities of a Product Owner. Personnel is also needed to:

- Oversee and communicates the vision for development projects

- Liaisons for stakeholders
- Be responsible for using data to certify that any software developed meets business needs and aligns with our strategic goals.
- Assist in the establishment of development processes to support continuous improvement, efficiency, and adoption of a dev-ops culture focused on building healthy and productive relationships between developers and operations.

Clients are becoming more demanding, expecting the completion of more complex projects for less money, shorter timelines, and a significant efficiency increase. Each client having unique technologies, needs, and wants. There is a competitive edge to be gained by offering to architect custom software solutions for a handful of strategically selected clients, exclusively tailored to their business needs. An external-facing Product Owner provides the needed discovery and analysis with the focus of embedding your technology into your clients systems, setting up repeat business and long-term relationships.

These days, it seems our industry is being driven toward the cloud because of its immediate benefits to coordination, collaboration, and visualization of data trends and analytics. There is no shortage of third-party software available to address the multitude of needs in our industry, but most do not provide complete solutions. In most cases, some form of customization is needed in order for most cloud solutions to reach their full potential and meet your organizations standard for managing, executing, and delivering projects. Flexible custom integrations between systems will reduce human intervention and spearhead more productive and efficient day-to-day processes. Product Owners are:

- An essential component to creating a coherent vision for how new and existing technologies will coexist
- Identifying how use automation and data aggregation to streamline workflows
- Keeping our developers focused on what they well

The Software Engineer's Perspective

Without a product owner, IT and dev teams often become the product owners. Ultimately whoever is first to take any measure of accountability over a system becomes, more-or-less, the permanent owner of that system. They then need to field change requests from across the organization and are tasked with resolving change conflicts and juggling priorities.

Developers are highly specialized resources who aren't trained to know your industry's processes. They know computer science concepts like automation, data, performance, and security. Expecting them to then also make judgements about which changes are more valuable to the AEC industry than others is a recipe for disaster. There needs to be someone in the middle – someone who knows AEC and can sort out what's truly valuable. That someone is a product owner.

You already have product owners – they just may not know it yet. Who plans and manages the rollout of new version of Revit within your organization? There's your Revit product owner!

Every industry benefits from having a well-defined product ownership role. Whether it's design software, scheduling software, or Microsoft Office, someone needs to own the vision for those systems. It applies both to off-the-shelf solutions as well as custom ones.

Who is looking forward a year? 3 years? 5 years? If you don't have someone looking forward and staying ahead of the tech and you're making short-term snap decisions, you're creating technical debt you'll be paying off for years to come.

The Business Analyst's Perspective

Companies standardly hire engineers, designers, and project managers. Corporate side exists, but normally just the standard IT, HR and the like. It is not standard to hire for product ownership. There is so much technology and different platforms being used in a company, but there is not normally ownership beyond just helpdesk support.

Lots of products exist for organizations to use, but other than specific product company consultants, there is a need for internal representatives to coordinate with them and understand how the company works and how the product can fit, be molded, or mold us to work within it. Most operations members don't think that way, nor have the time to do so. Having a PO can ensure you get the most value out of the external consultants to really ensure the product meets the company needs.

From an outside perspective can consider how a process is done, why it is done in a certain way, and connect that to what the product offers. There is some clarity achieved in being able to separate out how something is done and why it is done that way. A PO can look impartially at everything and determine where the greatest efficiencies lie without the baggage that normally comes with the whys. Yes, why something is done in a particular way is important, but only so far as knowing what the root reason is. Usually, why is also accompanied with "because that is how we do it"- a PO needs to dig deeper and really understand why, to ensure the product or process can meet those expectations.

There can be too many cooks in the kitchen. Allowing everyone's opinions to be heard is fine, but someone needs to be the roadblock before those opinions reach the developers to sort out what should or should not be taken into consideration. It is also important to have someone who can take the differing opinions between all stakeholders and find the common ground or the most appropriate decision for the product. Being familiar with the product and process gives the overarching visibility needed to make those priority decisions.

Once a product is "off the ground" it still requires improvements and adaptation throughout its life to get the most value out of it. So, an owner is necessary beyond initial product creation. Any changes that happen to the product or within the company need to be accounted for. Consider it like a car's annual checkup- not required, but probably a good idea to do regardless.

The Product Owner, an Asset to the Technology-Minded AEC Firm

From the Technologist's Perspective

Technology is as disruptive as ever in our industry, this conference is essentially a celebration of that disruption. Many firms are embracing it, by hiring software developers to create things like Revit add-ins and other automations. However there is a missing link that is needed if we are to truly reap the benefits of develop or staff and the products that you wish to build.

There are distinct differences in how software engineer's work and function compared to our typical operational engineer. We need to understand their work patterns to optimize the

productivity of our development staff. If you've been in this industry for any length of time you are used to the quirks that come with engineers in the AEC space. Being a plumbing designer for over a decade, it's safe to say I have inherited some of these quirks myself. That being said, we know how to work with them and know what environments they work best in. The same goes for software engineers, they need structure, goal orientation, and time to focus on their work. A Product Owner helps accomplish this by ensuring the development team is fully aware of the problem they are solving, how the solution will function, and look. When the technical staff is not accountable for the what-and-when to build decisions, they can focus on architecting the solution and delivering value. The responsibilities of fielding support tasks, handling non-technical items, and prioritizing feature requests are left to the Product Owner. For more information refer to Makers Schedule, Managers Schedule written by Paul Graham <<http://www.paulgraham.com/makersschedule.html>>

In the current state of their role, our software developers are spending a considerable amount of time not writing code. They split their time between managing projects, scheduling meetings, interviewing stakeholders, and owning communication plans, with ineffective results. Our company has a department staffed with software developers that provide end-user support for our back-office software: ERP, Power BI Server, SharePoint, Training software, our mobile App, Intranet Tools and salary admin page. 50% of their time is spent in meetings, gathering user feedback, and troubleshooting user issues. Yet in still, there is often a disconnect between what was requested and what is delivered. Somewhere in the communication loop, signals are getting crossed, leading to underwhelmed clients and overly stressed personnel.

Defining and communicating an application's vision and roadmap is essential in ensuring alignment between various business units. To meet the needs of users and organizational objectives, the entire corporation should understand the goals and objectives set out for the product and how it will benefit them personally. Product Owners interpret stakeholder requests, making them palatable for all involved, promoting agile approaches to solve problems while representing the internal client's voice. It's their job to understand the needs and pain points that users experience by routinely gathering feedback and analyzing it for trends and insights. They then filter this information back into the development process, hoping to exceed expectations.

The Software Engineer's Perspective

The product owner acts like an account manager, but for a technology solution. When you go to interact with a client, your first point of contact is the account manager. They know how to work with the client and what the client's needs are. Chances are that whatever idea you're bringing to the table may not even make it past the account manager. Why should it be any different with technology solutions?

The product owner is someone who knows the processes in and out and what will best serve the users and business goals. They're always on the lookout for new optimizations and have a clear vision of what the product will be months and even years from now. People and processes change over time, and the solutions will need to follow suit. A good product owner stays on top of that, watching trends and being responsive to change.

Often changes come with disruptive side effects. This is especially the case when there isn't someone analyzing the requested changes who has intimate knowledge of the system being changed. A seemingly innocuous change to one feature may completely break a workflow for a

whole department, or worse! A product owner serves as the first filter, finding these potentially disruptive changes and correcting (or discarding) them appropriately.

While end-users may generate some great ideas, they don't know everything. A product owner has that 10,000-foot big picture view that grants them insights that those doing the work may not have discovered on their own. If a product owner is only reactive to requests from end-users, they might as well be replaced by an answering machine for the dev team. They need to take advantage of their unique perspective and connections to proactively enhance the solutions they own.

The Business Analyst's Perspective

A product owner can create improvements and find ways to help the company grow. They aren't focused on the day-to-day of getting project deliverables to clients. A PO has the flexibility to see the big picture yet consider the individual workflows that their product interacts with. They also understand the product to know where adaptations can be made to benefit the user, or where user processes need to change around the product to gain other benefits.

A PO is also the voice of the customer [whether that is designers, engineers, PMs, management- whoever]. They should understand their workflows and processes (sometimes better than them) to know what can help them, and if what they are asking for is really what they need. Often times, a single stakeholder might want a specific thing to help their day-to-day, but a PO can see the larger picture and with an understanding of the workflows, determine there is an alternate, more effective solution. On the other hand, if a product is not meeting the needs of the customer, the PO is their advocate to the product company and attempt to get the necessary changes made.

An important part is being detached from the work enough to be unemotional about decisions, yet still invested in the success of the overall concept. As a person, I really have no interest in how your files are stored- keep them on a floppy disk. But- as the PO of a document management system, it is my goal to make this product as successful as possible. If that means denying suggestions, so be it – success doesn't mean everyone is always happy. Deprioritizing or denying requests that aren't in line with the vision of the product is part of the job. If it means needing to hear multiple reasoning's, all in defiance with one another then deciding, that's what I'm here for. Not having an inherit stake in the game allows unbiased decision making.

When to Implement the Product Owner Role

The Technologist's Perspective

Custom software solutions and integrations between new and existing technologies are becoming the norm at forward thinking, technology-minded firms. If you have software engineers on staff, now is the time to fully empower them by relieving them of project management duties and allowing them to focus on what they do best.

There are a multitude start-ups and third-party applications popping up to tackle the many of needs of a project. Most do not provide complete solutions to the problems they are addressing. In most cases, your organization will need to integrate new software with core processes and existing enterprise systems, basically develop a solution for your solution. This process typically involves discovery sessions with many stakeholders to gather feature requests, and is usually where things begin to fall off the

rails, as too much feedback and competing ideals can quickly become your worst nightmare. A Product Owner acts as the voice of both the customer, corralling any and all conflicting feedback or information, and filtering it into a clear and concise vision for the product. The Product Owner also assists the development team by fielding support issues, handling non-technical items, and prioritizing feature requests for the development team. Quality assurance is a large part of their responsibility as well. They review the final product and are the last line of defense against scope creep and any other factors that can cause the final product to not align with the original vision.

Product Owners are a step in the right direction when developing an innovative culture at your organization. This is a position that requires you to be constantly curious, continuously assessing existing process to identify where efficiencies can be gained. To accomplish this, operational and back-office staff are often questioned and observed, inevitably promoting an innovative, dev-ops culture. A culture where all personnel in your organization seek to eliminate the mundane repetitive tasks with automations and keep a finger on the pulse of the latest and greatest industry trends that could help your stay a step ahead of the competition.

The Software Engineer's Perspective

Have you noticed deadlines slipping? Did your go-live date fall back a week? A month? It may be that your team is tied up in meetings and emails and phone calls and not writing code and configuring systems. Dev team throughput drops dramatically when they're forced to assume the role of product ownership. Isn't there someone else who could better handle those communications? Perhaps someone who knows AEC, who knows the processes?

You may also notice a breakdown of communications between your dev team and business users. When a product lacks an owner, there exists a tug-of-war between the dev team and the users, each thinking they need to be ultimately responsible for owning the solution. This can damage relationships and create an "us vs. them" mentality between the dev team and the business. Inserting a product owner into the middle of these communications establishes clear ownership and authority and can bring everyone back to feeling like they're on the same team again.

As I just mentioned, developers will often end up taking on the role of product ownership, either intentionally or just by association. If you have developers making business decisions about your systems, maybe consider at least getting a second voice involved if you can't outright re-assign product ownership.

All systems have a lifespan, and one of the worst things we can do is forget about systems and let them linger on for eternity. I've seen companies that have systems over a decade old, but nobody dares touch them because nobody understands them. Those systems may do absolutely nothing, but because everyone who knew that system has left the company, current staff is left in the dark and in fear of causing disruption. There needs to be 2 things: 1) clear ownership, and a transfer of ownership when an owner leaves the company and 2) product owners must make it a recurring task to check-in on their systems to see if any can be sunsetted.

The Business Analyst's Perspective

It is never too early. I started doing process improvements on things not necessarily technology related. Finding ways to improve workflows and procedures outside of our delivery or modeling platforms already provided time and cost savings. At that point, I was a product owner of processes. Eventually, some of those processes were moved into more technology related products, so we had a head start on understanding where the breakdowns in our workflows were and getting those fixed.

Need the PO to be familiar with how you work and form relationships with the team- how can you speak for the stakeholders without their trust to do so? I think that doing these process improvements and really getting into understanding how work is done was an important step. Before looking at how technology can solve a problem, there needs to be an understanding of what the problem is.

All products should have an owner. Change requests are coming in all the time about products, without an owner, who decides which ones should be done or not done, and how are they prioritized? If no one owns it, it is owned by committee- which adds another layer of complexity

With large technology changes, it is important to have POs involved from the beginning to understand the big picture. But even without going through a large technology change, having that ownership for just continuous improvement will provide value.

Real World Examples of Value

The Technologist's Perspective

BIM 360 is a hot topic right now, a making pace to become the industry standard going forward. As a BIM 360 subject matter expert, I essentially act as the Product Owner, even though it is not custom software that was created in house. By interfacing with project teams, performing training on the platform, and collecting feedback that is shared with Autodesk's product team and the software engineers in my department, I fulfill many of the duties included in the role. It is a nice stepping stone to help develop the skills needed for the direction I would like my career to go in the future. I urge all VDC personnel and technologists alike that are yearning for a new challenge to begin working on these skills in your current position, as there are many ways to flex your Product Owner muscles in your current role.

At SSOE, we have a fond relationship with point clouds and laser scanners. We own 5 Leica BLK 360's and 1 Leica RTC, all of them are being used constantly on project sites to document existing conditions. Because of the growing need for laser scanning on our projects, we needed streamline our laser scanner checkout process, integrate it with the billing/accounting process, and make the entire process as transparent as possible from start to finish. Our local point cloud guru and I worked in tandem with the developers in our department to create a website to meet the needs of the staff and build the foundation for the future of laser scanner tracking at SSOE. This process included wire framing the existing process in which our staff would checkout a scanner and working with software engineers to define the new process.

Our company is in the beginning stages of a complete overhaul of our core processes. Our CEO has tasked us with a number of goals that align to our mission of saving clients time, trouble and money. We are migrating all of our project data from on premise locations to the cloud, starting with BIM 360. Larisa and I have been acting as Product Owners of this initiative, fulfilling the

many duties and responsibilities that come along with the role. Discovery sessions with different business units on specific functions in the project execution process, creating new processes based on those findings, and documenting the process workflows are just some of tasks we complete. We also create training documentation and videos, and interface with the executive sponsors of the initiative for feedback and approval. In later phases of the implementation, we will continue building out the vision for integration between Microsoft Dynamics and BIM 360.

The Software Engineer's Perspective

We have a custom Revit add-in that lacks an owner. Requests for changes come from several places without considering of downstream impacts - they only focus on their immediate need. A recent change request would disrupt typical Revit workflow (the sync action) and make changes to another critical system more challenging and impactful. The dev team proceeded under the perceived authority of the requestor, but before deploying the team decide to act as product owners. They scheduled a risk analysis meeting that included additional stakeholders and management, and the result was a redesign that was far less impactful to the business while still delivering the original need.

We have a custom web application that has strong product ownership. Change requests come in from many sources and the product owner filters them before they ever make it to the developer backlog. Each request that passes this first filter is analyzed extensively by the product owner and one or more members of the dev team before work ever gets scheduled to make sure everyone understands the full impact, and any consequences, of the change. With the product owner in place, continuous improvement of this business-critical system has become almost trivial. The team can develop enhancements with confidence and the changes have minimal, often zero, negative impact to the business.

The Business Analyst's Perspective

Have worked with contractors who are implementing a new platform for AE use, and they don't appear to have a true PO- generally we worked either with the GC representatives or the developers. The implementation was disorganized and did not meet the goals of the AE, GC, or client. No single person had true ownership of the product or understood the process well enough to translate what was being asked for into actionable items for developers. Instead, the developers took their best guess at what people wanted and required rounds and rounds of rework and discussion to attempt to convey needs.

SSOE developed an internal schedule, deliverable, and tracking database for one of our divisions. I owned the idea creation, UI design, testing, and oversaw rollout, training, and adoption. Having a committed resource allowed this to be possible, for a few months, it was 80% of my job. Without someone driving the truck, it won't move on its own. Now, I manage the change requests, creating training for any updates, and working with developers for continuous improvement items. Some of those items are not stakeholder driven and others are.

In Closing

The Business Analyst's Closing Remarks

I feel this is a very important role within every firm and finding the right people is the first step. We need to broaden our search and think outside the box. I have no engineering background and couldn't really tell you much about what my coworkers do. I have never even touched Revit-

yet I can understand how my coworkers do their work, which is all that matters. I couldn't create a drawing, but I have given trainings and discussed workflows with people on how the process works. Getting creative thinkers in the door doesn't require that they have an engineering background.

Once you have the right person/people, the next step is making the change- which is the hard part. If it ain't broke, don't fix it isn't always true. A bike may have a slow leak- but you can still ride it, though you probably still want to fix that before it goes flat. Your technology and processes might be getting you along fine now, but the efficiency lost is worth the time and effort to see that leak stopped, and likely find that there is even more gained on top of that.

The Software Engineer's Closing Remarks

Whether Product Owner is a full-time job is a balancing act that varies with the scale and complexity of your systems and at what point each is in their lifecycle. Many systems are simple enough that one business user might take the product owner role for a given system and only need to invest a handful of hours per month of their time. Others require full-time attention.

One person can be the product owner of many systems - but this can get out of control quickly. Taking ownership of too many systems can easily lead to burnout. Have a good strategy in place to transfer ownership if demand ramps up for multiple systems simultaneously.

You will save yourself a great deal of headache, and money, by establishing this role in your organization. It is a preventative action that you can take today that will alleviate some of the future costs, uncertainty, and instability that comes from a lack of vision and oversight. If you've ever replaced a system and started by having to ask "What's still in this system? Does anyone even use this?" – you've felt the pain of having poor product ownership.

The Technologist's Closing Remarks

At last year's AU I learned that we are behind the farming industry in technology innovation and adoption, after much research, I can say the same is true for our technology-forward roles. This conference is about promoting the latest and greatest in design and construction technology. What is often forgotten is the need for updating the roles to reflect the technological advances being made in other areas of the industry.

Establishing the Product Owner is a critical next step for the AEC industry to provide cross-functional leadership to support continuous improvement and efficiency in software development processes & projects, building a culture ripe for innovation.