



Beyond Product Management: Managing Complex Digital Solutions in the Enterprise

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Executive Summary

Product management has evolved as a discipline that is considered indispensable in most technologically-oriented product companies. However, rather than taking products to market individually, many organizations take complex combinations of offerings, referred to in this white paper as “solutions”, to market and are finding that traditional approaches to product management are insufficient to ensure sustainable leadership in the markets they serve. In this white paper, we’ll define what a solution and contrast its management with that of a product. We’ll also introduce a robust definition for a role called “solution management”, which is responsible for defining solutions, getting them to market and driving a successful business based on them.

This paper is intended for executives and product leadership in product and solution companies as well as professionals who find themselves managing solutions, even though “product” may be a prominent part of their title. We’ll talk about the key challenges facing “solution-oriented” organizations and suggest a path to transition from a traditional product mindset into one that recognizes the criticality of solutions in solving complex, enterprise problems.

What is a solution?

The term “solution” is used commonly but imprecisely in the tech industry. To provide a precise definition, we must first consider a taxonomy of “offerings”, i.e., “things” developed by a vendor to be sold to a market. In our experience, very few organizations have a clear taxonomy describing the types of offerings they take to market. Far from being an esoteric or academic exercise, analyzing the nature of what you offer to market is critical in terms of defining associated accountabilities for the development, delivery and overall business success of these offerings.

The Offering Taxonomy

Below, we offer an “offering taxonomy” providing a small set of simple definitions and making important distinctions between offering types.

Type	Description	Comment	Examples
Offering	Anything offered by a vendor to the market (usually for sale)	Offering is a blanket term for the terms defined below.	See definitions below
Re-usable Asset	A good developed for a specific customer (physical or virtual).	Sometimes called a “bespoke offering” or “project asset”.	<ul style="list-style-type: none"> ▪ Custom billing system ▪ “Best of breed” integration project
Product	A good offered to a market to be consumed in essentially the same form by multiple customers.	Types: hardware ¹ , software, data/content.	<ul style="list-style-type: none"> ▪ Photoshop ▪ Quickbooks ▪ Headphones ▪ Minecraft ▪ Network router
Service	Doing work on behalf of a customer	Contrast with “product”.	Consulting, education, commercial paper shredding
Solution	Multiple offerings (products, services and other solutions) assembled to solve customer or market problems	An aggregate concept often required to solve complex market problems.	<ul style="list-style-type: none"> ▪ SAP ERP implementation (software + services) ▪ Airport communication system (radios, network hardware, software, implementation services)

¹ Some hardware contains “embedded” software. Since the software is not purchased separately, we consider the hardware a single product offering rather than a solution.

These offering types are differentiated because of material differences in *how they must be managed throughout their life cycle*. Of particular interest are the the differing skills and knowledge required by those accountable for the success of each of the types of offerings. For example, product management has evolved as a discipline accountable for maximizing the business value of *products* throughout their life-cycles. However, we should not assume that a competent product manager will be skilled in defining *services* such as consulting or education services.

Types of Solutions

Some complex problems lend themselves to solutions comprising constituent offerings that can be assembled and taken *together* to market. These **market solutions**, those defined prior to being taken to market and designed to address the needs of multiple potential customers, differ from **bespoke solutions**, those assembled to meet the needs of a single customer. In this paper, we will focus primarily on market solutions as the similarity of the solutions life-cycle with the product life-cycle is an essential concept in terms of the management discipline we'll define.

We'll focus on complex solutions addressing complex problems, often comprising tens or even hundreds of offerings. We refer to organizations that derive a significant proportion of their revenue from delivering solutions to market as **solution-oriented organizations**.

Although solutions come in all shapes and sizes, in this white paper **our primary focus will be on solutions incorporating significant digital technology aimed at “enterprise scale” problems**, particularly market solutions, like these examples:

- Urban surveillance solutions comprising video cameras, network equipment and command and control software supported by implementation and maintenance services
- Airport communication systems comprising radios, high-availability networks, software applications for air traffic controllers and system design consulting services
- Utility grid management systems comprising sensors and data fusion software
- Automotive testing solutions comprising physical testing equipment with embedded software, analytics software and services for test development and execution.

Why create market solutions?

The rationale for creating market solutions is essentially the same as that for creating products:

- Standardization reduces development expense over time, increasing vendor profitability
- The market perceives superior quality and predictability from standardized offerings
- Parts of the market prefers holistic solutions from a single vendor to “best of breed” solutions they must integrate themselves (or pay to have integrated)

Although the rationale for product and solution development is similar, defining and managing solutions requires a set of skills that are often not required or simply not as critical as those required to manage individual products.

What is the Enterprise?



In this paper, we’ll focus on solutions in the “enterprise space”. The term “enterprise” has traditionally referred to commerce between businesses, also referred to as “B2B”. Over time, the term has come to connote scale in terms of organization size, complexity and even the mission criticality of the offerings taken to market. In this paper, we’ll use the

term to describe both vendor and consumer organizations with a significant number of following characteristics:

- More than a few hundred employees
- Processes and roles that have matured to the point that an “efficiency penalty” is paid as coordination between roles becomes more complicated and processes become less flexible
- A portfolio comprising multiple offerings, sometimes 10s or even 100s of products, services and solutions
- Addressing very complex problems or solving simple problems at a scale that generates massive complexity

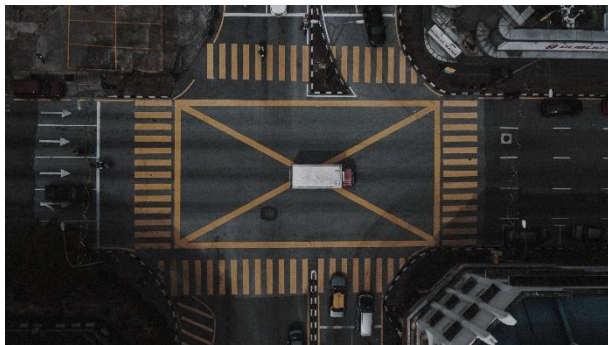
Solution Case Study: Eagle Eyes

Eagle Vision, Inc.² is a provider of urban video surveillance solutions. Their flagship solution, EagleEyez, combines powerful video cameras connected by a secure network to a command and control (C&C) center, where safety operators use a sophisticated software application to facilitate responses to safety issues automatically detected by software monitoring the cameras' video streams (video analytics). First responders like police can use a mobile app to communicate via voice, images and video with the command and control center while responding to events.



Eagle Vision would like to enhance traditional “fixed” video cameras with cameras mounted on unmanned aerial vehicles (UAVs, a.k.a. drones) as the basis for a mobile video surveillance capability. The constituent parts of the EagleEyez solution, examples listed below, must evolve together quickly to capitalize on this compelling market opportunity:

1. Video analytics must evolve to compensate for a camera that is not fixed (a very difficult conceptual and computational problem)
2. The command & control application must evolve to show the location of drones and display their video feeds
3. The first-responder app must display UAV feeds and provide first responders limit control of drones, e.g., return to base.



Each of these offerings has a product manager responsible for its evolution. Based on requirements coming from customer-facing disciplines like sales and consulting, these product managers must coordinate the development of their offerings to incorporate functionality required to support UAV surveillance.

² Eagle Vision is a fabricated company based on Prickril Consulting's experience with multiple global solution-oriented organizations.

Enterprise Solution Development Challenges

Like many solution-oriented organizations, Eagle Vision faces the following challenges with respect to managing the EagleEyez solution.

1. Lack of Offering Roadmap Alignment

To solve complex market problems, a solution's constituent offerings must evolve in unison. Coordinating the development of these offerings, including products and services, tends to increase the size of the dependency matrix between offerings resulting in substantial strategic and operational challenges. Chief among these challenges is a decrease in time-to-market caused by the development schedule of the "long pole" (the offering that takes the longest to become market-ready). Convincing product groups to contribute to the success of solutions, often to the perceived detriment of their own product business, can also be a massive challenge. *For EagleEyez UAV-enabled solution to be successful, changes to the product roadmaps of the video analytics, responder app and C&C software must be aligned and coordinated. The video analytics group has a backlog of partner requirements that is different from the UAV-related requirements.*

2. Coherent View of Development Progress

When development on a solution's constituent parts is spread among teams that are distributed organizationally and geographically, it is often very difficult to ascertain a clear picture of overall development progress and thus manage stakeholder expectations regarding solution scope and delivery schedule. *Eagle Vision's management and product managers have difficulty understanding the status of development related to delivering UAV capability because engineering is distributed among 2 business units and 3 locations. Getting status updates from product managers often takes several days and still fails to paint a complete picture.*

3. Lack of Clear Investment Rationale

Although suboptimal decision-making can occur in any organization, solution-oriented organizations face special challenges as solution teams vie for development capacity from product and services teams. Without a clear business-oriented decision-making process, e.g., a portfolio process, decision-making can stagnate and become seemingly arbitrary, resulting in development investments that frustrate product and solution teams and fail to maximize business returns. The complexity of solutions may also result in "local optimization" within solution groups at the expense of broader organizational

objectives. *Eagle Vision's executive leadership team must now intelligently allocate development investments among offerings in their portfolio, ensuring that the strategic vision represented by UAV-enablement is sufficiently funded.*

4. Counterproductive Contention for Resources

Often a product of deferred or unstructured decision-making, contention for resources, especially engineering resources, can cause internal rancor among solution delivery and product development groups, resulting in inefficient communication and “micro” decision making, lowering morale and eventually compromising business performance. *Eagle Vision has suffered from morale issues related to fierce, product team-level competition for the best engineers as well as centrally managed functions such as quality and UX.*

5. Difficulty Pricing Competitively

The complexity of differing pricing models among a solution's constituent offerings can make solution pricing difficult. Development organizations may be incented based on product revenue measures which may be difficult to “tease out” from an accounting perspective based on a solution purchasing contract. Also, some customers may compare costs offering by offering, complicating the sales process by distracting them from considering the overall solution value and price.

Many of these challenges can be addressed or mitigated by empowering a discipline at the solution level analogous to product management at the product level. In the following sections, we'll suggest a new discipline called ‘solution management’ that can help organizations manage and even overcome these challenges.

What is solution management?

Solution management, as described in this paper, is a professional discipline accountable for maximizing the business value of solutions, particularly market solutions, throughout their life-cycle. We contend that managing solutions is complex enough and sufficiently different from traditional product management to warrant an organizational role on par with product management, i.e., a solution manager is to a solution what a product manager is to a product.

Solution Management is Not New...

The role of “solution management” and related roles like “solution specialist” and “solution architect” exist today. However, unlike the product management-like role with end-to-end functional accountability for solutions that we propose in this paper, solution managers today are often *delivery-oriented*, tasked with managing development of custom (“bespoke” as opposed to “market”) solutions for specific customers or delivery of market solutions as part of a customer project. These solution roles analyze customer project requirements and then work with development teams “back at the lab” to fulfill these requirements. This “arm’s length” relationship with the engineering teams leads to difficulty coordinating the roadmaps of the constituent offerings and a reactive or tactical approach to development, which in turn increases time to market, increasing project risk and lowering project margins.

As in the case of products, direct, ongoing engagement with engineering (and other internal stakeholders) is required to ensure that the solution development stays on course, solving real market problems. Managing the evolution of solutions from a delivery perspective also tends to result in solutions that meet customer needs at the expense of evolving market needs, resulting in solutions that are perpetually attempting to catch up to competitive offerings and organizations that are reactive instead of pro-active relative to the market.

Solution Management Accountabilities and Activities

Solution management can be thought of as a superset of product management in terms of responsibility and activities. Solution managers should have end-to-end accountability for the success of the solution, although, much like product managers, they tend to have little explicit authority.

Key Similarities with Product Management

These solution management activities are analogous to product management activities but at the solution, rather than the product level:

Defining the Solution Strategy and Roadmap

Solution managers must define a strategy for the evolution of the solution and define a roadmap demonstrating delivery to the market based on a solution vision. Because solutions tend to be B2B oriented and address complex problems, the product roadmap is particularly important to customers and prospects, who need assurances that their business plans, which may extend 5 years and beyond, will be supported rather than disrupted.

Defining Business Objectives and Tracking Business Performance

Solution managers work with executive leadership, sales and marketing to define business performance objectives and are responsible for monitoring relevant metrics and taking corrective action as necessary.

Analyzing Markets and Customers

Solution managers must understand the markets they serve, the needs of their customers and must balance these sometimes opposing forces. Some complex solutions address “niche markets” comprising a relatively low number of potential customers, e.g., airport security solutions, blurring the line between “customer” and “market”.

Managing Market and Customer Requirements

Solution managers are responsible for identifying and articulating market and customer requirements with enough specificity to allow product groups to implement the corresponding features. Requirements management at the solution level can be extremely complex as requirements may often be defined in detail in requests for proposals (RFPs) and must be expressed as a hierarchy, i.e., solution requirements being mapped to product requirements.

Solution Management and the Organization

Although an exhaustive discussion of how the solution management function fits in the overall organizational context is beyond the scope of this paper, it is worth noting that, as is the case with some products, some solutions reach a level of complexity that requires a solution management *team*. For example, Eagle Vision may decide to name a “head solution manager” for the entire EagleEyez solution with a small team of direct reports focused on key aspects of the solution, e.g., hardware, software, UAV management.

It is also important to acknowledge that a solution orientation will impact other product disciplines. The marketing organization, for example, must understand and accept the offering taxonomy, assigning accountability and creating the appropriate messaging and collateral *at the solution level*. Engaging with marketing early in the process of adopting a solution focus can avoid unnecessary inter-function friction and inefficient and ineffective go-to-market efforts, resulting in faster time-to-market for the solution.

Important Differences from Product Management

Although similar in many ways to product management, solution managers deal with challenges that are specific to managing solutions or must be faced at a scale that is rare when managing products.

Stakeholder Management (Breadth and Depth)

The breadth of offerings included in a solution, the overall cost of development and reliance on third parties such as ecosystem partners make stakeholder management more complex than that required for many products. The need to actively manage important stakeholders may leave solution managers with less time to manage requirements and do functional product definition. For large solution, a small team of solution managers may be required (just as complex products may be supported by a team of product managers).

Tracking Financial Business Metrics

Monitoring the business performance of solutions can be difficult or, in some cases, virtually impossible. For example, to track revenue at the solution level, the accounting systems must be configured appropriately. Unfortunately, ERPs and other backend systems cannot track financial information at the solution level, leaving product managers to cobble together a coherent picture from a myriad of products, including difficult to track discounts.



Deep Knowledgeable of Solution Delivery

Complex solutions often require lengthy, complicated implementation projects. Some of these projects are driven by ecosystem partners. Solution managers must be keenly aware of implementation requirements, ensuring that the entire solution life-cycle at the customer is adequately supported, e.g., installation, upgrade, troubleshooting.

Knowledge of Different Product Types

To be effective, solution managers must understand the life-cycle and development peculiarities of both software and hardware products as well as the definition and delivery of services. Understanding the rigors of manufacturing can be a challenge for SMs who have traditionally managed software products, for instance.

The Benefits of Solution Management

When implemented properly with the appropriate empowerment, solution managers can help solution-oriented organizations thrive in the markets they serve. Some of the key benefits are:

Foresight to Anticipate Market Needs

By assigning a solution manager to market solutions and requiring that they develop a strategy and roadmap for their offering, the organization can break out of a reactive mindset, identify opportunities in the market and be among the first to deliver solutions that address them.

More Efficient and Coherent Alignment of Roadmaps

Solution managers engage closely with product teams, developing relationships based on the definition of their role that help them communicate requirements and get commitment from product teams that are included in the products' roadmaps and are delivered to the market

Coherent Status on Solution Development

Defining and delivering solutions to market as part of a holistic program improves transparency into development status, making it easier to manage stakeholder expectations and improving collaboration and communication between constituent offering development teams.

Solution Management and Product Management: Better Together



The solution management role does not in any way replace the product management role. Canonically, products comprised by the solution will continue to require dedicated product managers. The relationship between solution management and product management depends primarily on how the product is taken to market. There are two relevant delivery modes:

1. Solution-only products which always go to market with a solution or solutions
2. Mixed-delivery products go to market independently and with a solution or solutions

In the solution-only approach, solution managers become product managers' primary stakeholder, with PMs working to fulfill market requirements defined by the associated solution managers. In mixed-delivery mode, product managers must balance the needs of solution management with those of the broader market they are serving. Engagement with solution management as a stakeholder creates unique challenges for product managers.

Product Management Challenges in the Solution-oriented Organization

Product management becomes more complex in a solution-oriented organization in that PMs have a new, important stakeholder to manage: the solution manager. If multiple solutions incorporate a product, affected product manager must prioritize development priorities between them. This need for constant prioritization can place the product manager at the center of a “battle” for development resources and leave them feeling resentful at their plight. Even in the best of cases, a responsible PM needs support from the organization to ensure the appropriate business decisions are made, thus avoiding suboptimal returns on development investments.

In the case of products that continue to go to market outside the context of a solution, product managers must prioritize requirements between the product's market and customers and those of the solutions that incorporate them. This more complex prioritization matrix requires careful consideration of the associated business cases in light of organizational and offering strategy.

EagleEyez Epilogue

To ensure rapid delivery of a high-quality solution to the market, Eagle Vision has named Ari Zadic the solution manager for the EagleEyez solution. Ari's business case, including expected revenue, cost and features for the new version with UAV-based surveillance has been approved. He must now work with a variety of stakeholders whose offerings must evolve to deliver on the solution roadmap he's defined:

- The **product managers** for the command & control software and the video analytics software must implement new features to support the UAV-based scenarios
- A new product manager must be named to evaluate and procure the drones and drone cameras needed to support solution requirements

- The **Professional Services** organization must:
 - Upskill personnel to architect solutions with the new capability
 - Train field consultants to implement the solution for customers
 - Create training courses for customer staff.

Furthermore, **marketing communications** must generate new collateral for multiple customer stakeholders like executive leadership and IT professionals and the **sales organization** must be trained to position the new offering and a sales demo must be developed. Other disciplines not directly impacted with offering definition and delivery, like legal and HR, will also have to adapt.

For the solution to be successful, Ari must coordinate the efforts of all these stakeholders to ensure timely delivery of the solution to market at a cost that will support financial objectives such as margin.

The Profile of a Solution Manager

The profile of a solution manager is very similar to that of a product manager with far greater emphasis on the following areas:

- **Understanding highly complex market problems**
Large solutions require understanding the complex problems they address. Solution managers often require deep domain experience that requires years to acquire. Professionals acting in a solution management capacity (even though they don't have the title), often come from the delivery organization, where they've spent time helping customer implement complex solutions.
- **Discipline to resist strong pressure from a small customer base**
In markets with just hundreds or fewer customers, this installed base can wield an unhealthy amount of power, driving a customer/market investment ratio that is at least suboptimal and, at worst, not sustainable. Successful solution managers are constantly assessing development investments in terms of their impact on the customers they have versus the customers they would like to have.
- **Ability to create compelling business cases and influence stakeholders**
Solution-oriented organizations tend to have complex decision-making practices, as solution vie for limited development resources from product groups. To generate sustainable success, solution managers must understand the investment decision-making process, e.g., portfolio process, and actively

engage with stakeholders to ensure the levels of investment they need to execute on their solution roadmap.

- **Partnering**

Solutions may require partners to contribute offerings to the solution, offer integration with the solution or provide necessary services like education. Managing relationships with third parties, often constrained by contractually-defined obligations, can be a critical skill for solution managers. At scale, solution managers should be liaising with a dedicated partner or ecosystem management organization.

Solutions and Scaling Agile

The discipline of solution management as described in this paper is highly compatible with Agile scaling approaches, particularly the Scaled Agile Framework (SAFe). SAFe describes a solution as the outcome of a “value stream” and talks about functional ownership at both the solution and product levels. Organizations leveraging SAFe can benefit from many of the concepts introduced in this paper, e.g., the offering taxonomy, to complement the SAFe body of knowledge and help ensure the success of their SAFe implementation.



Moving Beyond Product Management

This paper’s central thesis is that solution-oriented organizations benefit from the clear definition of solutions as an offering type and from a functional role accountable for solution success, analogous to the widely accepted role of product management as it relates to products. Moving the organization toward a solution-management mindset is not a trivial undertaking. In this section, we’ll suggest a logical progression of activities for assessing the need for the solution management role and finally implementing it in as non-disruptive a manner as possible.

1. Adopt an Offering Taxonomy

Proposing an offering taxonomy and getting buy-in is a critical step in generating broad understanding of the nature of your organization’s offerings and sets up a discussion regarding the appropriate accountability for their success. If you don’t have a taxonomy, consider starting with the one proposed in this paper, adapting where critical. To maintain a functional, commercial perspective, try to avoid using technical terms like “system” and “component” to describe offerings.

2. Create an Offering Inventory

Once you've defined offering types in a taxonomy, create an inventory of your organization's offerings, assigning each to one of the types. Aligning the entire organization on this inventory is likely to be much more lengthy and complicated than you might expect, but is hugely valuable in terms of aligning effort around them.

3. Assess Solution-oriented Pain

Refer to the Challenges Section of this paper and brainstorm the specific pain felt by members of your organization and their stakeholders regarding the management of your organization's solutions throughout their life-cycle. Collect data and anecdotes to support and quantify the pain you identify. Inability to clearly articulate the pain and its impact on the organization will make advocating for change much more difficult.

4. Pilot Solution Management

The next step to adopting solution management is initiating a pilot to learn how to integrate the approach into your organization's development approach. The solution manager should create a strategy and roadmap for the solution and actively engage with impacted product managers. Some organizations begin solution management roll-out with a new solution with smaller scope than mature offerings.

After a successful pilot, you should do a detailed retrospective, collect learnings and then define solution management as a role throughout the organization by getting executive buy-in, creating formal HR positions and upskilling solution managers.

A Helping Hand

Many solution-oriented organizations are finding it harder to remain competitive as solution time-to-market is extended due to slow decision making, lack of requirement-feature fit, and difficulty in coordinating solution-oriented efforts across the organization. Defining a new role based on the discipline of solution management can help these organization address these challenges, regaining competitive advantage and increasing market share. Prickril Consulting has experience helping global organizations make this transition as quickly and painlessly as possible. Visit us at www.prickril.com to begin exploring how we can be of service.

Glossary

bespoke solution	A solution assembled to meet the requirements of a single customer. See solution.
good	An offering comprising a virtual or physical thing
market solution	A solution created to meet market needs and defined before being taken to market (although it may be heavily customized upon delivery).
offering	A good or service offered for consumption to a market by a vendor
offering taxonomy	A classification of the “things” developed by a vendor for sale to a market, e.g., products, services
service	Work that is performed on behalf of a customer
solution	An offering comprising other offerings
solution management	A professional discipline accountable for maximizing the business value of solutions throughout their life-cycle
solution-oriented organization	An organization that derives a significant proportion of its revenue from selling solutions