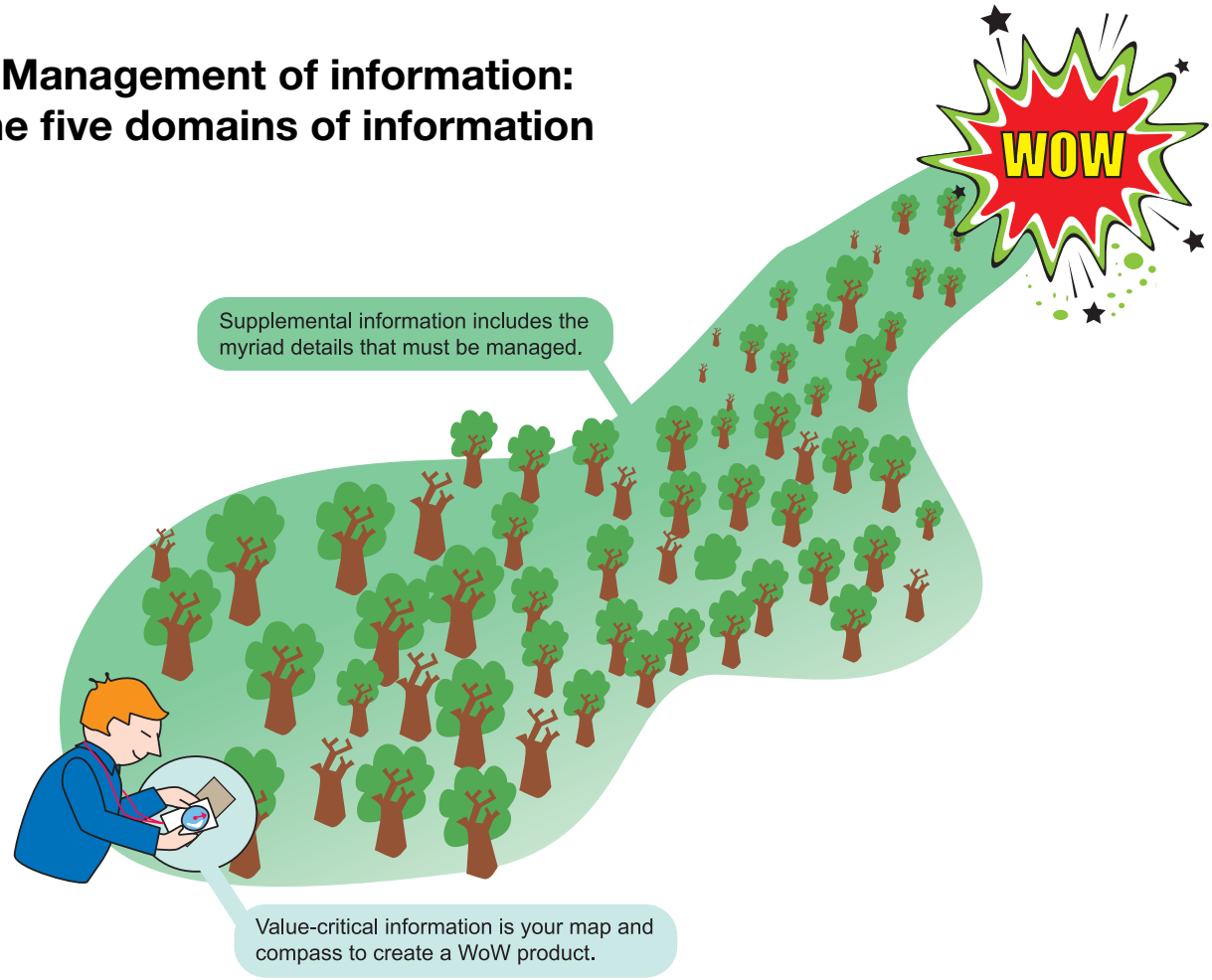
3. Management of information: The five domains of information



In my experience, ineffective information management stands out as one of the most frequent causes of failure in product development. This reality is not surprising, considering that a development project needs to manage many interconnected areas. From understanding customer needs to navigating the complexities of technology, intellectual property rights, and manufacturing, each area contributes to a vast and intricate web of information. It's a whole forest of information that you have to navigate through. It's easy to get lost in this forest and lose sight of customer value.

Access to value-critical information is vital when it comes to helping you navigate through this maze of details. This type of information acts as a beacon, illuminating the path ahead and providing essential support for informed decision-making. Just like a map and compass guide an explorer through new territory, value-critical information helps track your position and offers direction. It enables you to maintain an overview of the project, ensuring you remain on the right track to create a product with unrivaled customer value.

However, it is crucial to note that while value-critical information provides a general framework, it does not dictate every single step along your journey.

In contrast, all other information that you need to manage can be classified as specific or supplemental information. This category encompasses the bulk of the data you will encounter and rely on as you advance along your chosen path. Specific information includes the myriad details that must be captured, created, and documented to define, manufacture, and deliver your product or service effectively. While this information is rich in detail and plays a significant role in influencing each step you take, it often lacks the comprehensive overview necessary to keep customer value in focus.

Fortunately, most companies have already established systems to manage specific information effectively. It could be some software variant for:

- Product data management
- Content management
- Product information management

- Master data management
- Digital asset management.

However, value-critical information is unsuitable for management by any such software. There is a saying in engineering that “the devil” is in the details, which correctly describes the importance of paying attention to details. When it comes to value-critical information,”the magic” lies in the details. If you try to squeeze value-critical information into your existing software for handling information, you will probably lose so many nuances and details that ”the magic” is lost.

This chapter contains the following:

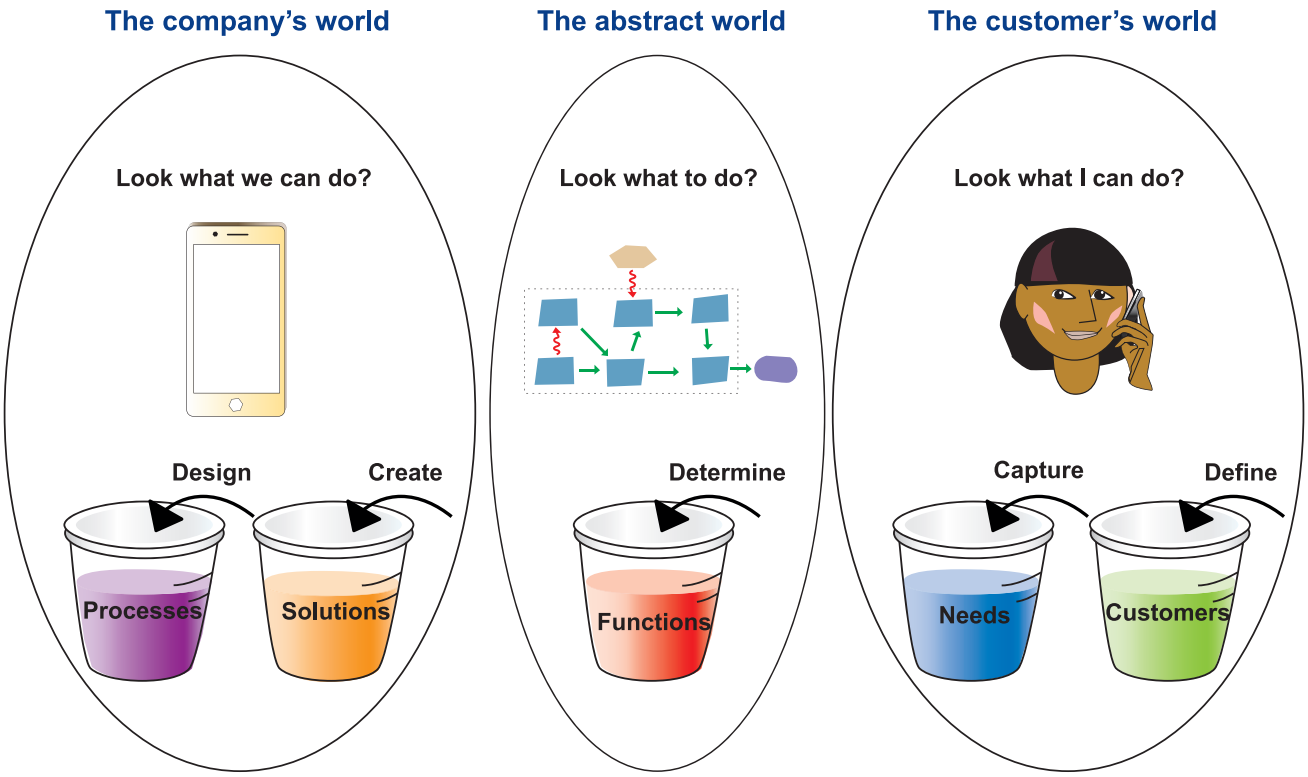
3.1 Introduction to the five Domains of information

Value-critical information must run like a thread or connecting train of thought in the development project. This information ensures that all decisions made keep customer value in focus. That the voice of the customer stays loud and clear and is not watered out by all compromises made to manage internal demands.

Value-critical information needs to build a comprehensive- and cohesive picture encompassing five different information domains in the following way:

Customers
A carefully selected, well-defined, and documented market segment where the new product has the potential to become market-leading. A market segment where your company has unique advantages and opportunities to create a highly lucrative business.

Needs
An accurate, authentic, and prioritized documentation of the outcomes or desired results that your new product must achieve to have unrivaled customer value. Documentation made in the customer’s own language without bias of internal interpretations.



Functions
An abstract description in terms of the functionality and performance of the new product illustrating how the new product creates and diminishes customer value. Functions is the information domain best suited for measuring value.

Solutions
A clearly defined and structured definition of your new product, including the system architecture and the value-increasing challenges it solves.

Processes
A clear definition of how the new product supports the various touchpoints in the customer journey, making the journey easy, effortless, and enjoyable for the customer.

There is a logic between the information domains, starting from broad general information in the Needs domain and becoming more detailed and process-oriented in the Process domain. By asking the question "how," you can peel back the layers of abstraction to uncover the specific steps necessary to fulfill a need. Conversely, asking the question "why" allows you to move in the opposite direction, exploring the motivations behind each decision.

This simple and stupid example illustrates the point. Consider a scenario where I am the customer:

- Need: I urgently need to inform my wife that I am running late.

How?

- Function: Send a message.

How?

- Solution: I use Snapchat on my mobile device.

How?

- Process: Take a picture, type a message, and send it off.

Or

- Process: I take a picture, type a message, and send it off.

Why?

- Solution: Make a Snapchat on my mobile device.

Why?

- Function: I want to send a message.

Why?

- Need: I urgently need to inform my wife that I am running late.

Why?

- More interesting but out of scope for this documentation :-)

Asking the "how" or "why" questions does not typically facilitate a move between different information domains. More often, they enable navigation within the same domain's hierarchy. All value-critical information can be structured in a hierarchy in all domains. This means that both questions can help you to explore deeper layers or higher levels of understanding regarding a specific topic. This hierarchical structure allows for a comprehensive analysis of value-critical information.

Some of the most common mistakes I see concerning value-critical information are the following:

Customers
The development teams lack a clear, unambiguous, and unified definition of the customer. Market segments are often unclear, too broad, and inhomogeneous.

Needs
Customer needs are often based on anecdotal evidence, lacking concrete data and traceability to support the claims. Furthermore, there is a tendency to confuse technical solutions, functions, and internal demands with actual customer needs.

Functions
Usually, it is the weakest domain because it lacks precise and structured information. Functions are not consistently used as a common platform for measuring value, specifications, benchmarking, and problem-solving. There is often a lack of robust functional and cost-based thinking.

Solutions
Organizations frequently get bogged down in an ineffective mindset, prioritizing countless minor tweaks and ideas rather than embracing meaning-

ful innovation. This makes companies unprepared or unable to adapt to changing market conditions and customer needs, ultimately risking stagnation and decline.

Processes
Companies struggle with a development process that is overly detailed and rigid, often prioritizing bureaucracy over common sense. Processes and the new product tend to be optimized from an internal perspective, and not to make the customer journey easy, effortless, and enjoyable.

The five domains of information can be categorized into three distinct worlds. This classification highlights their relationships and reinforces my belief that the optimal approach is to utilize all five: Customer, Needs, Functions, Solutions, and Processes.

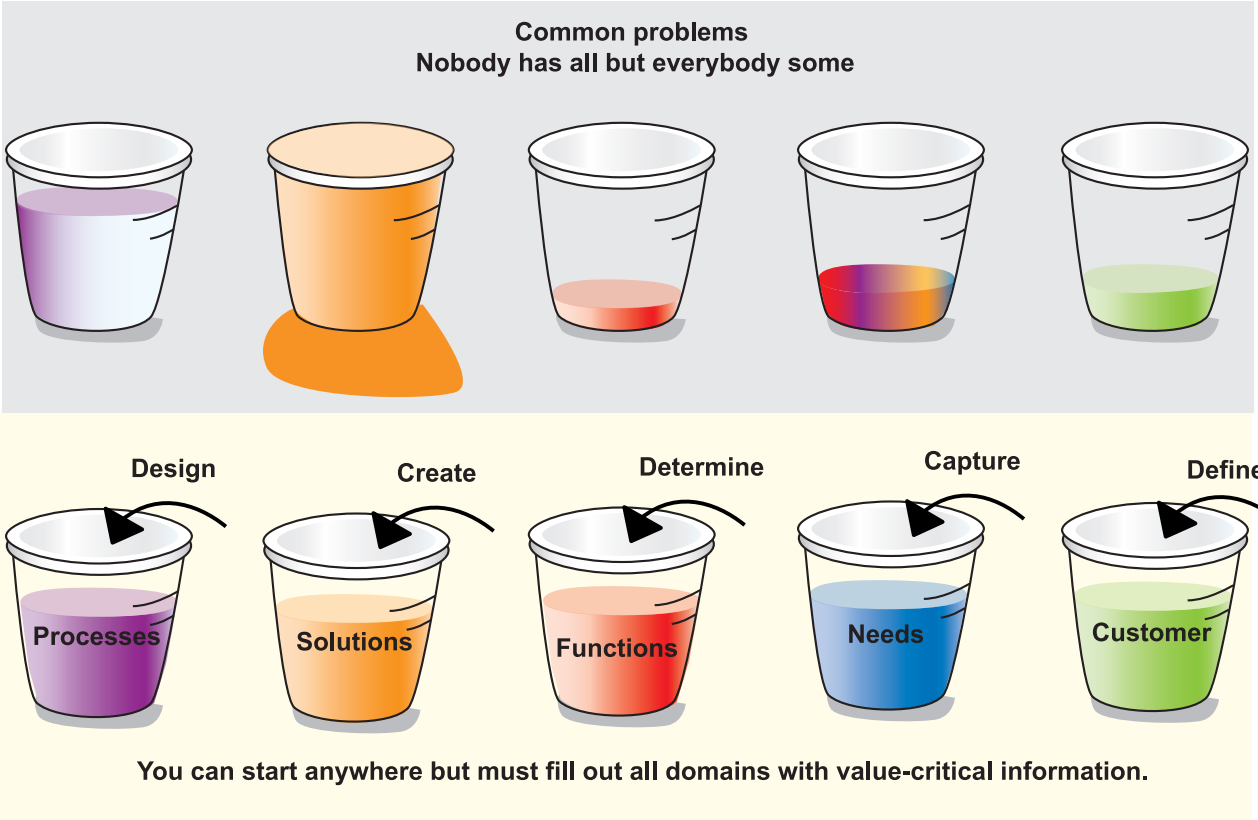
3.2 The customer's world consists of the domains of Customers and Needs

The customer's world is inherently dynamic, with its own rules and trends. It is entirely outside of your company's control. As a result, businesses must remain agile and adaptive, continuously monitoring and responding to changes in the customer's world.

Ultimately, the customer's world holds the power to determine the success or failure of your new product. The customers are the final arbiters of whether your new product will be perceived as a WoW product or not. In essence, the Customer and Needs domains serve as a reminder that a company's survival and prosperity depend on its ability to navigate and adapt to the complexities of the external world, with a relentless focus on delivering value to its customers.

Developing products and testing them in the market through a trial-and-error approach is the most precise method of marketing research available. Yet, it also comes with the highest costs. It resembles throwing darts in the dark, not knowing the precise location of the target. This is often due to misconceptions such as the belief that because your salespeople interact with customers daily, your company already knows the customer needs.

In my experience, few companies have the proper methods and skills to understand, capture, and communicate value-critical information in the customer's world. They spend far too little time and resources on the two information domains of Customers and Needs.



You will no longer be throwing darts in ”the dark” by enhancing your ability to collect and document value-critical information within the Customers and Needs domains. Instead, you will precisely understand the target's exact location.

3.3 The company's world consists of the domains of Solutions and Processes

The domains of Solutions and Processes create an internal landscape where your company has complete control and greater freedom of operation. This autonomy allows your organization to design its internal processes and workflows according to what you believe is most effective and efficient. You can tailor your operations to align with your strategic goals. Your company can also decide and develop the products and services you like.
You would believe that making improvements is easy as you have complete freedom to change the company's world. My experiences tell a different story. Change is always challenging as it taps into deep-rooted traditions and the comfort of the status quo. Introducing new work methods is rarely simple, as you have to overcome skepticism and pushback. Furthermore, radical innovations can disrupt existing power dynamics, leading to active opposition from various factions within the organization, significantly complicating the transformation process.

If the customer's world defines the target's exact location, then the company's world revolves around the skills and strategies needed to throw those darts effectively. This includes refining processes, cultivating talent, and implementing strategies that enhance your organization's ability to create innovative products with the capacity to become WoW Products.

3.4 The abstract world consists of Functions to connect the customer's world to the company's world

The value-critical information that needs to be managed exists in two different worlds: the customer's world and the company's world. In a development project, information must flow back and forth between these two worlds. For example, subjective customer needs must be translated into technical specifications.

The information in the Customers, Needs, Solutions, and Processes domains is detailed and specific. To use a mathematical term, we could say that the information is arithmetic. We are at the level that 2+2=4. It is a basic toolkit of information that is essential but limited. It is unsuitable for measuring value, long-term planning, and solving more complex tasks.

In mathematics, the concept of algebra has been developed to deal with more complex tasks and handle general relationships and unknown values. The concrete level of 2+2=4 is replaced with an abstract level of a+b=c. In product development, we need something similar to algebra, which we call Functions. The information in this domain is abstract, enabling us to create a measurable representation of customer value, benchmark solutions, solve complex technical problems, and much more.

The functional language is solution-neutral and covers what the product should do and preferably not do. Functions define the interaction between the product, the customer, and the surrounding environment.

Mastering the functional domain will take your professional skills to the next level. You will better understand how your product creates and destroys customer value. You will have access to new, powerful tools that make complex problems easy to solve at an innovative level. In short, you will become more brilliant.

The customer's world provides the precise location of the target, revealing who the customers are and what the customers truly need. The company's world enhances your skills, offering tools and methods necessary for effective execution. The functions serve as that abstract yet essential world that connects the two. Improve your tactics and ensure that every dart you throw optimizes your chances of winning.

3.5 Start anywhere, go everywhere

You can start anywhere. It doesn't matter which domain you start. The only rule is that you have to go everywhere. Fill all the domains with value-

critical information. The work is iterative and not linear. You don't start with Customers and end with Processes. Instead, you move back and forth through the five information domains, refining and evolving your knowledge and ideas. Creating a WoW product requires a flexible approach to product development. Blindly following a development process can stifle innovation and kill your next big idea rather than bring it to life.

A project can move between the domains in the following way:

- You have a general idea of a new innovative solution! (Solution domain)
- What essential customer needs will it fulfill? (Needs domain)
- How many customers have that need? (Customers domain)
- Can it be made? (Processes domain)
- What functions are essential? (Functions domain)
- We learn and can create a more detailed solution (Solutions domain)
- Are the customers willing to pay for this? We need to know more about the resource constraints (Needs domain)
- What is the best way to segment the market? (Customers domain)
- …

You add more information, learn, adjust, and fine-tune, and eventually, the connecting train of information is complete. All domains are filled with all the value-critical information needed to put the next WoW product on the market.

The use of five information domains has shown its strength in practice, not least from the perspective that project teams want to use it and believe it makes their work more efficient. I believe one of the reasons for this is that it agrees with the intuitive way most development engineers think. Methods that simplify and improve the natural and intuitive manner of doing things are logically much more straightforward to adopt. Training goes faster, and above all, improvements are lasting.

3.6 Information domains in other tools

The idea of different information domains in product development is not new, and various frameworks have emerged to facilitate understanding and decision-making in this complex process. Among the more well-known methodologies are:

- **Quality Function Deployment (QFD)**

QFD typically categorizes information into four domains: Needs, Global Parameters, Solutions, and Processes. Each domain handles a specific type of information, allowing teams to translate customer needs into actionable design and process criteria. QFD employs matrixes to translate information between domains, and this thorough and systematic approach may become cumbersome and time-consuming, leading to frustration among product development teams.

A significant drawback of QFD is the lack of a well-structured functional domain, which may hinder teams from fully grasping the functional relationships underpinning product performance. However, the preplanning matrix used for Customer Needs is excellent and something I have incorporated into the toolbox.

- **Axiomatic Design**

Axiomatic Design uses four domains: Customer, Functional, Physical, and Process. While this method is academically interesting, it may not translate effectively into practical use. Axiomatic Design lacks a dedicated Needs domain, which could limit its ability to capture customer needs. Furthermore, the framework is somewhat deficient in providing clear methodologies for moving between its domains, which may leave practitioners uncertain about navigating the complexities of product development. On the positive side, Axiomatic Design's first axiom of maintaining the independence of functional requirements provides a valuable design principle. By ensuring that improving one function does not adversely affect others, this axiom supports creating products that are easier to control and manage for customers.

- **The Jobs-to-be-Done (JTBD)**

JTBD theory claims that customers purchase products and services primarily to accomplish specific tasks or "jobs." However, I think that this perspective oversimplifies the motivations be-

hind customer behavior. In my view, people buy products to satisfy needs, a distinction that holds significant implications for product development. While some may argue that this is merely a matter of semantics, the difference is substantial. JTBD attempts to quantify needs, but the information in the Needs domain is inherently unmeasurable, as it reflects customers' subjective opinions, thoughts, and feelings. Consequently, JTBD tends to compress vast insights into the functional domain, leading to an overly complex and convoluted framework.

3.7 Summary

In conclusion, the significance of effective information management in product development cannot be overstated. It serves as the backbone of successful projects, allowing teams to navigate the complexities of various domains while keeping the focus on delivering exceptional value to customers. By prioritizing the management of value-critical information alongside supplemental information, organizations can enhance their decision-making capabilities and ultimately foster the creation of successful products.

The journey may be filled with challenges, but with the right tools and strategies in place, it is possible to transform the dense forest of information into a well-charted path toward success.

You can start in any domain, but conquering all must be your game plan.

