Chapter 8 - Describing the Need: Specifications and Requirements

Chapter highlights

Purpose: This chapter sets forth VITA's policies and guidance on preparing effective specifications and requirements for the procurement of IT goods and services.

Key points:

- By their nature, specifications set limits and thereby eliminate or restrict items that are outside the boundaries drawn. Technology specifications should be written to encourage, not discourage, competition consistent with seeking overall economy for the purpose and technology solution intended.
- Specifications constitute the heart of a contract document that will govern the supplier of required goods or services in the performance of the contract as well as the basis for judging compliance.
- Fixing a requirement error after delivery can cost up to 100 times the cost of fixing the implementation error.
- The procurement requirements are the foundation for the solicitation's and contract's scope and statement of work.

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8.0 Introduction

The IT procurement process includes all activities from planning, preparation of requirements and processing of a requisition, solicitation, evaluation, award and contract formation, to receipt and acceptance of delivery, payment, inventory tracking and goods and services disposition. Regardless of whether the technology product or service required is processed by the agency under its delegated authority, purchased off a statewide contract or sent to VITA for procurement, the workflow is essentially the same.

Two preliminary and critical steps that need to be completed when preparing for any technology acquisition:

- Identify the technology business need and the type of technology product or service that will best fulfill the technology need. Identify a technology solution, not a specific product, which would meet that technology need. Keeping in mind cost containment, what is the product or service that best fulfills the job requirements? This may require that the agency purchasing personnel or VITA personnel meet with end user(s) to identify needs, craft requirements and propose technology solutions.

- Develop requirements and/or specifications that reflect the business objectives and describe the characteristics of the technology product, service or solution being sought. Consideration should be given to suitability and to overall cost effectiveness in addition to acceptability and initial price. Technology specifications should be written to encourage competition consistent with seeking overall economy for the purpose and technology solution intended. The goal is to invite maximum reasonable competition while procuring the best technology solution for the Commonwealth. For more information on VITA's Technology Sourcing Process, please contact scminfo@vita.virginia.gov.

8.1 Information technologyspecifications

An IT specification is a description of a technology product or service a customer seeks to procure and is also a description of what a supplier must be prepared to offer to be considered for an award. Specifications describe the technical requirements for a material, product, or service and include the criteria for determining whether these requirements are met. A specification may describe the performance parameters which a supplier has to meet, or it may provide a complete design disclosure of the work or job to be done.

Specifications provide the basis for judging whether or not the supplier has met the requirements in the solicitation. The nature of the technology good or service being procured will determine whether specifications will be long or short and what descriptive format should be used. Most specifications contain a description of the requirements and quality assurance provisions and will thoroughly define the minimum requirements of the needed technology.

Specifications are the only way to obtain the IT goods or services required. Specifications constitute the heart of a contract document that will govern the supplier of required goods or services in the performance of the contract as become the basis for judging compliance. Good specifications promote full and unrestricted competition through setting forth actual, minimum requirements as opposed to desires. Specifications should also contain quality assurance provisions which provide a means of determining that the supplier has met the contractual requirements. Specifications should be clear and precise. If requirements are ambiguous or leave room for interpretation, suppliers are entitled to make interpretations that work to their own advantage. A good specification should:

- Be based on the business need.
- Emphasize performance rather than design.
- Not require features not needed for the product or solution's intended use.
- Identify the essential characteristics of the desired product or solution.
- Not be written by a bidder/offeror or prepared with the assistance of a potential bidder/offeror.
- Leverage commercial, off-the-shelf products.

- Avoid requirements that favor a particular vendor.
- Allow for competition to the maximum extent possible.
- Be quantifiable rather than qualitative.
- Be verifiable.
- Not overstate quality, but plainly define performance expectations and needs for the intended business purpose.
- Avoid the use of words such as "must" or "shall" as these restrict competition and often rule out a supplier with a new and innovative solution.

8.2 Characteristics of effective IT specifications

Effective IT specifications will be written with certain characteristics that include:

- Simple: Avoid unnecessary detail, but be complete enough to ensure that requirements will satisfy their intended purpose.
- Clear: Use terminology that is understandable to the agency and suppliers. Avoid legalese type language and jargon whenever possible. Include definitions of terms where needed to mitigate conflicting interpretations and to align with Commonwealth and/or agency-specific technology terms and definitions.
- Informative: Describe the agency's desired state for the IT solution, to include usage and audience and any technical/functional needs/restrictions, workflows or data flows, interface with other applications/systems and architecture for legacy systems, platforms, operating systems that must align with Commonwealth or the agency's overall IT strategy.
- Accurate: Use units of measure or performance compatible with industry standards. All quantities and packing, delivery and acceptance requirements should be clearly identified. Include all required state, federal and/or national technical, professional, industry standards, specifications and certifications, as needed.
- Flexible: Avoid inflexible specifications which prevent the acceptance of a proposal that could offer greater performance for fewer dollars. Use approximate values such as dimensions, weight, speed, etc. (whenever possible) if they will satisfy the intended purpose. If approximate dimensions are used, it should be within a 10% rule of thumb unless otherwise stated in the solicitation document.

In order to promote fair and open competition among all suppliers and to motivate offerors to prepare creative and innovative proposals, specifications should be written as openly as possible. IT business owners and agencies should avoid writing restrictive requirements/specifications by:

- Including only essential requirements of the IT product, service or solution needed.
- Avoiding restrictive or impractical requirements such as those that are nonessential or obsolete.
- Carefully check product delivery or project schedule requirements to ensure the turnaround time from supplier's receipt of order to completion is not too restrictive or limiting.
- Defining requirements to promote and encourage suppliers to propose standard, commercially available products, solutions or services where possible.
- Not specifying a particular brand name, product or feature that is peculiar to one manufacturer, except for reference purposes.
- Not dictating detailed design solutions prematurely.
- Allowing sufficient time for suppliers to review the technology need, consider the requirements, and prepare and submit a proposal.

One of the first considerations in preparing specifications should be determining what type of specifications will best describe the technology needed. There are certain types of specifications: standard, design, performance, or brand.

8.3 Standard specifications

Standard specifications are those that are used for most purchases. In order to develop standard specifications, an agency may examine the characteristics and needs for products, solutions or services of similar end usage and develop a single specification that will satisfy the need for most purchases. Standard specifications are created for the express purpose of establishing performance and quality levels. Standard specifications may be particularly useful for commonly used items. Standard specifications may also reduce the variety of items being purchased, thus facilitating the consolidation of requirements into larger volume bids. Standard specifications eliminate duplicative specification writing.

8.4 Design specifications

Design specifications set the requirements for the product or solution being purchased by detailing the desired characteristics in definitive terms. Design specifications may also include the dimensions, tolerances and specific manufacturing processes. To fully describe the agency's need, design specifications may be very lengthy, however, care must be taken to ensure that design specifications are not written so tightly that they unfairly preclude other suppliers from offering their supplies or services.

Design specifications are not conducive to procuring commercial off-the-shelf products and the specifications are not tailored to the commercial market place. Design specifications, may, as a result of being over-specific, unnecessarily limit the competition for a particular product, solution or service.

8.5 Performance specifications

Performance specifications are more widely used and more flexible than design or standard specifications. Performance specifications describe the needed or desired capabilities of the product, solution, services and/or supplier, or performance requirements for deliverables. Performance specifications provide a description and purpose of the IT product or service needed but only include minimal functional specifications, usually including only those functions which correlate specifically with identified agency or Commonwealth business needs. Performance specifications should be compatible with existing equipment and should contain a description of the existing equipment along with any upgrade requirements or future needs.

Performance specifications do not describe the best available item on the market but describe exactly what the agency needs to meet its business objectives. These specifications should state what the needed product or solution is to do without setting out specific technical detail. Performance specifications can include requirements for output, capacity, dimensional limitations, maneuverability, degree of tolerance or accuracy and other needs. If the performance specifications are restrictive, the solicitation should be specific as to why the restrictive requirements are necessary for the particular business need. If maintenance is a requirement, the specifications should include what maintenance arrangement would be most acceptable to the agency for the items being purchased.

Performance specifications throw the responsibility for a satisfactory IT product, solution or service back to the supplier. Because performance specifications are results- and use- oriented, the supplier is left with the decision of which product, solution and/or service would be most suitable for the agency's needs.

8.6 Brand namespecifications

Brand name specifications are the most restrictive type of specification. Brand specifications should only be used when there is only one brand acceptable to meet a specific need. When it is determined to be impractical to develop a generic specification, a brand name may be referenced to convey the general style, type, character and quality of the article desired. Unless otherwise provided in the solicitation the name of a certain brand, make or manufacturer does not restrict potential suppliers to the specific brand or manufacturer named. In addition, a brand specification may be available from more than one source and should be competed. Any agency which is brand-specific in its IT needs should be mindful that any rejection of similar, but not brand-specific, products should be based solely on an equitable evaluation of comparable products and their failure to meet a specific stated need.

If a brand specification is used, it should include the common generic identification of the IT product, the make, the model or catalog number and the name and address of the manufacturer as well as an itemization of the salient characteristics, performance or other criteria that are required of the brand name IT product. A brand

specification should only be used to purchase a standard IT product for which a complete definition is impractical. Use of a brand name specification can promote competition if there are enough “equals” to the brand in the marketplace. Brand name or equivalent specifications shall seek to designate three, or as many different brands as are practicable, as "or equivalent" references and shall further state that substantially equivalent products to those designated may be considered for award.

A brand name proprietary specification restricts the acceptable IT products to those of one or more specified manufacturers. It is appropriate to use a proprietary specification when the desired product must be compatible with or is an integral component of existing equipment or products, or where prequalification of products is necessary to support specific needs of a program; is covered by a patent or copyright; must yield absolute continuity of results; or is one with which an agency has had extensive training and experience, and the use of any other similar piece of equipment would require considerable reorientation and training. Every effort should be made in the solicitation process to obtain full competition among value-added resellers or distributors which carry the manufacturer’s IT product.

A written determination for the use of a proprietary specification must be made in advance of the procurement and be included in the procurement file.

8.6.1 When to use brand name or equivalentspecifications

Brand name or equivalent specifications may be used when the IT purchasing professional or business owner determines that:

- No other design, performance, or qualified product list is available;
- Time does not permit the preparation of another form of purchase description, not including a brand name specification;
- The nature of the product or the nature of the requirements makes use of a brand name or equivalent specification suitable for the procurement; or
- Use of a brand name or equivalent specification is in the Commonwealth’s best interest.

8.6.2 Required characteristics of brand name specifications

Unless the IT purchasing professional or technology business owner determines that the essential characteristics of the brand name included in the specifications are commonly known in the industry or trade, the brand name or equivalent specifications shall include a description of the particular design, functional, or performance characteristics required.

8.6.3 Nonrestrictive use of brand name or equivalent specifications

Where a brand name or equivalent specification is used in a solicitation, the solicitation shall contain explanatory language that the use of a brand name is for the purpose of describing the standard of quality, performance, and characteristics desired and is not intended to limit or restrict competition.

8.6.4 Determination of equivalents

Any prospective supplier may apply in writing for a pre-bid/proposal determination of brand name equivalence by the agency purchasing professional who is assigned to the procurement. If sufficient information is provided by the prospective suppliers, the agency purchasing professional may determine, in writing and prior to the bid or proposal opening time, that the proposed product would be equivalent to the brand name used in the solicitation. Any IT product which the Commonwealth, in its sole discretion, determines to be the equal of that specified shall be accepted.

8.6.5 Specifications of equivalents required for bid/proposal submittal

Suppliers proposing equivalent products must include in their bid/proposal submittal the manufacturer's specifications for those products. Brand names and model numbers are used for identification and reference purposes only.

8.7 Qualified products/suppliers specifications and lists

It is sometimes necessary to prequalify products or suppliers and only solicit those who have been prequalified. In such cases, a list is maintained of specific products (“Qualified Product List” or “QPL”) or suppliers (“Qualified

Supplier List" or "QSL") which have been evaluated and determined to be acceptable in meeting predetermined minimum acceptable levels of quality or performance (*Code of Virginia*, § 2.2-4317). This qualification is performed in advance of any particular IT procurement. By having a prequalification procedure, the time in the purchase cycle for specification development and testing can be reduced. The qualification requirements for supplier or product prequalification must be established and potential suppliers advised by letter and/or public posting sufficiently in advance of the anticipated procurement to allow for evaluation and qualification of potential suppliers and/or products. A supplier whose product or service has been determined not qualified will be advised in writing. Solicitations may be sent to only those suppliers determined to be qualified.

A QPL or QSL provides an advance determination as to which IT suppliers or products can meet the agency's requirements. A QPL identifies various brands that have met specific criteria. Bidding may be limited to those suppliers whose products are on the list. Awards then may be made to IT products on the QPL. A supplier who submits a bid/proposal for a non-QPL product when a QPL product is required is deemed nonresponsive.

There are many benefits in developing a QPL. Once a QPL is established, the solicitation may be used for submission of samples or products to be examined for initial inclusion on the list. Specifications should state the criteria that will be used to evaluate the IT products offered and should describe all requirements necessary for supplier's products to qualify for the list. A specifications draft may be circulated for review by suppliers and known interested bidders. Communication with interested suppliers when developing specifications and requirements may be very helpful. Potential suppliers may provide useful feedback on the feasibility of a particular requirement or specification, including performance requirements, statements of work and data requirements.

8.8 Analyzing and planning the IT procurement

Normally, the agency's business owner (i.e., project manager) and a team of technical subject matter experts will prepare the requirements definition, but procurement officials will want to ensure that the requirements have been well-planned and are adequate to define the procurement details in the scope statement and statement of work (refer to chapter 12, Statements of Work for IT Procurements). The solicitation's scope and/or statement of work will reflect the results of the requirements definition, analysis and planning. Below is a table that offers various high-level questions that a project team may need to consider when identifying and planning the project's requirements. The table below provides a generic tool. More detailed guidance consistent with VITA's technology program directives may be found at the following website: https://www.vita.virginia.gov/policy--governance/project-management/project-management-templates-tools/.

1	What are the project's primary objectives/ goals?	Determine the high-level goals of the procurement including all technical, functional, performance, performance or service-level expectations, schedule, user and customer audience objectives. Include services, hardware, software and licensing requirements. Consider modular or phased projects to accommodate your schedule/budget. Discuss long-term goals or life expectancy of the system/project.
2	What are the project's secondary objectives/ goals?	Determine the mid- and lower-level objectives for technical, functional, performance, performance or service-level expectations, schedule, user and customer audience elements of the procurement. Include services, hardware, software and licensing requirements.
3	What does the project need least?	Be honest in evaluating all unnecessary elements in this procurement, possibly removing results of questions 1 and 2 and moving them to question 12.
4	What is the current environment?	Prepare textual and graphic descriptions of the current technical and user environment, including personnel, other programs, agencies/entities and services affected.

5	What dependencies exist or may evolve?	Provide detail of other internal and external networks, servers, applications and/or systems, interfaces and legacy systems that will be affected by this procurement, including other agencies/entities/users and the VITA Partnership.
6	Is this procurement consistent with agency- specific and the Commonwealth's strategic planning?	Identify any direct or potential conflicts this procurement may create with your own agency's or the Commonwealth's short-term or long-term enterprise strategies or other objectives. Contact your current AITR for assistance with this question.
7	What can be done in- house?	Re-visit questions 1 and 2 and match current staff or roles to the detailed objectives.
8	What does the agency need to procure from external sources?	Answers should include all hardware, software, support services, implementation, design, interface development, training, maintenance, etc. Be sure to conduct a search of existing statewide contracts that may serve some or all of these needs: (https://vita.cobblestonesystems.com/public/).
9	What is the budget?	Define the project's definite and projected budget sources and timing. Include budget sources for out-year support and maintenance and any phased procurement activity, and/or federal funding.
10	What is the in-house estimate?	Developing a work breakdown structure to use as the basis of your estimate is recommended, as this could parlay into the requirements and/or statement of work portions of the procurement documentation (i.e., solicitation and contract). This approach also helps to ensure that all details of the project's life cycle are considered and may offer justification during proposal evaluations.
11	What is the schedule?	Identify any hard and soft project schedule dates—overall and milestone events to use for any technical dependency concerns and for budget expenditure (and supplier payment) planning.
12	What can we put off buying?	Move answers from question 3 here. Include optional purchases for a next phase acquisition, if appropriate, and possible out-year support and maintenance depending on budget constraints.
13	What are our risks?	Brainstorm and identify all risks that could potentially affect the technical, functional and performance requirements including, installation, implementation, existing or relational applications/systems/user environments, interface development, production, testing, roll-out; budget and financial; schedule; licensing restrictions, supplier-hosted/cloud services etc. Apply mitigation resolutions when possible that could affect your agency, supplier and/or other third-party agencies/agents.

14	What specifications and standards must apply?	Create a document that lists names, numbers, version, etc., and provide links, if available, of all agency-specific, Commonwealth, VITA and/or federal, if federal grants apply, specifications and standards that are required for proper contract performance for all solutions, services and/or products being procured.
15	Is this a high-risk contract as defined by *Code of Virginia* § 2.2- 4303.01?	§ 2.2-4303.01 defines "high risk contracts" and any IT solicitation or contract that meets the definition of "high risk contract" must be reviewed by VITA and the Office of the Attorney General. Employees designated as primary administrators of high-risk contracts are required to complete a training program on effective contract administration created by DGS and VITA pursuant to requirements of the bill prior to commencing high-risk contract administration duties.
16	Have you ensured that your performance specifications contain distinct and measurable performance metrics and clear enforcement provisions?	All procurements that meet the definition of "high risk," as defined in Virginia Code § 2.2-4303.01, must include clear and distinct performance measures and enforcement provisions, including remedies in the case of non-performance. VITA's Contract Risk Management group will review each high risk IT solicitation and contract and consult the requesting agency on what steps needs to be taken in order for the high risk IT solicitation and/or contract to become compliant with § 2.2-4303.01. For more information, please contact scminfo@vita.virginia.gov.

The requirements analysis should begin with an agency's business or organizational requirements and those requirements should translate into project requirements included in the solicitation. If meeting the stated requirements will be unreasonably costly or take too long, the requirements may have to be negotiated down, down-scoped or down-sized, through discussions with SMEs, customers or users. The requirements analysis should cover the whole scope of the project. It must be comprehensive and thorough and must consider the views and needs of all the project stakeholders.

8.9 Building ITrequirements

IT Procurement requirements are defined as the need or demand for personnel, equipment, hardware, software, application/design solutions, hosting/cloud services or solutions, telecommunications, facilities, other resources, or services, by specified quantities for specific periods of time or at a specified time. Requirements are defined by the agency's business owner, and translated into a specification by the business owner and the agency's technical subject matter experts (SMEs). Requirements definition is the most crucial part of the IT project. Appendix 8.9 provides a helpful a checklist of factors to consider in formulating requirements.

The requirements document component of the solicitation is the official statement of what is required of the IT procurement. As far as possible, it should set forth what the product, solution or supplier should do, rather than how it should be done. The requirements document should include both a definition and a specification of requirements and include both functional and technical data. The procurement requirements become the foundation for the solicitation's and contract's scope and statement of work (refer to chapter 12).

There are four basic types of technology procurement requirements—mandatory, functional, technical and work or performance. These may be based on agency-specific or, as applicable, on Commonwealth security, enterprise architecture, infrastructure and/or strategic requirements. The following subsections provide discussion of these four types.

8.9.1 Mandatory requirements

Mandatory requirements are an agency's Prerequisite requirements. If there are a large number of mandatory requirements included in the solicitation, competition will be reduced as each potential supplier must meet the intent of each mandatory requirement, thus reducing the number of eligible offerors.

8.9.2 Functional requirements

Functional requirements document the business functionality for the IT product, service or solution that will meet the agency's needs. The procurement project's SMEs and business owner will provide the necessary documentation of the needed functionality. The functional requirement documentation is complete when the defined functional requirements of the business need have been fully described and all team members have agreed to the documentation.

Pre-solicitation planning time is the best time to validate the functional requirements. Incomplete functional requirements make it impossible to prepare accurate technical requirements documentation, invite misaligned supplier proposals and lead to extended project time and often failed implementation. Ensuring that comprehensive, complete and accurate functional requirements are included in the solicitation will increase the likelihood of a successful procurement. Functional requirements for an IT project include, but are not limited to:

- Work flow or business processes,
- Scope (what is included and what is not included),
- Inputs, outputs (files, systems, programs, reports),
- Databases
- Interface requirements
- Reporting requirements (hourly, daily, weekly, monthly hard or soft copy),
- Work rules,
- Performance standards, service levels, including remedies for non-performance, and regular reporting on performance standards and service levels.
- Documentation deliverables (methods, hard or soft copy).

8.9.3 Technical requirements

Technical requirements for an IT product or solution must include complete descriptions of the technical needs of the software or solution that will meet the agency's business and technical needs and VITA's technical standards. The agency's IT business owner and the project's technical SMEs will be responsible for defining and documenting the project's technical requirements. VITA's Project Management Division located at this link: https://www.vita.virginia.gov/it-governance/project-management/ can assist with this process. Technical requirements include items such as:

- Hardware
- Architecture
- Software
- Platforms
- Materials
- Space requirements
- Maintainability, Reliability, Confidentiality
- (Required only for IFBs and Competitive Sealed Bidding) Energy and Water Efficiency Requirements that meet the standards set forth in Virginia Code § 2.2-4328.1
- Materials
- Interfaces
- Program libraries
- Capacity limitations (scaling requirements)
- Operating systems
- Connectivity
- Capacity
- Construction
- Brand standards

8.9.4 Performance requirements

Performance requirements describe what the supplier must do to accomplish the work or deliver the required products, services or solution that may be unique to a particular IT project. These requirements may cover the required qualifications of a supplier and its project team, specific tasks and subtasks to be completed, parameters and restrictions on performance, time for completion of work (if not otherwise stated) and a list of deliverables the supplier must provide. See table in section 8.8 for more guidance.

8.9.5 Requirements quality control

Before any IT solicitation is released, the business owner, SMEs and the IT procurement professional should complete the checklist attached in Appendix 8.9.5 to verify completeness and quality of the requirements.

8.9.6 Prohibition against wired requirements

Incomplete requirements or "wired" requirements biased toward a particular supplier, product or solution will limit the number of competitive proposals received. In keeping with the Commonwealth's commitment to foster open and fair competition and to good faith dealings with suppliers, no agency should create or knowingly issue a wired solicitation.

8.9.7 Assistance by suppliers or potential suppliers in developing procurement specifications or requirements

A potential orexisting supplier may provide technical assistance to an agency free of charge in developing procurement specifications or requirements. However, an agency may not accept a bid or proposal or award a contract to a supplier who received compensation from the agency to provide assistance in the preparation of the specifications on which the solicitation or contract is based. A supplier who assists an agency in developing specifications or requirements may not disclose to any potential supplier who plans to submit a bid or proposal information concerning the procurement which is not available to the public. (Virginia Code §2.2-4373). In addition, the supplier who provided such development services for payment may not be a subcontractor or partner for the supplier who is awarded the contract or any of that supplier's subcontractors or partners, however far removed. Any independent contractor employed or otherwise paid by an agency to design a project, develop a scope of work, write specifications, or otherwise define contract requirements is also not eligible to compete for or receive the resulting contract.

Specifications or requirements may be provided to potential suppliers for comments and feedback before the solicitation is issued. Commonwealth agencies should leverage the expertise of suppliers in understanding the market for a particular IT good or service.

Suppliers may provide helpful information to the agency by identifying restrictive or proprietary features included in the specifications or requirements which could be challenged by other potential suppliers causing delays and/or cancellations. Suppliers can also assist the Commonwealth in understanding what end users really need to achieve their desired business processes, what the commercial and government best practices are in a particular IT area and who the experts are in the marketplace for a particular technical solution.