Build vs. Buy

Which is the best decision for MARSS?

Option Descriptions:
- **Build**: The Revisor's Office technical team, augmented by additional resources, would design and build the MARSS solution over time, leveraging the Revisor's Office current technology stack. A build solution would likely be augmented with purchased components.
- **Buy**: The MARSS system would be comprised of an on-premise purchased product along with other solution components (integrations and customizations), with implementation managed by the Revisor's Office technical team.

Consideration	Build	Buy
Alignment with and Support for Critical Requirements	• **Can build specifically to requirements.** The alignment of the solution to the defined requirements (functional, non-functional, technical and data), including the requirements to be met in the future, can be more easily assured with a build, as the requirements directly drive the design and enhancements. • **Does not preclude purchases to meet requirements.** Complete control over meeting the requirements would exist with a build, including the decision to augment the build with purchased components. • **Relevance to MARSS:** Design control via a build is desirable, and some MARSS requirements could still be met through purchased components. For instance, in the future, a workflow engine or advanced document/content management capabilities might be purchased.	• **Must meet current and future requirements before purchase.** A purchased product should be chosen based on how well it aligns with the requirements (functional, non-functional, technical and data), including requirements to be met in the future. • **Relevance to MARSS:** None of the evaluated products during the pilot fully met all requirements. This means that we need to either eliminate these unmet requirements or customize a purchased product to meet these unmet requirements. Customization of a purchased product is discouraged in the technology industry (more is said about this under customization implications below).
Longevity of Business Need	• **Flexible, dynamic and iterative, increasing longevity.** A build solution can adjust to the appropriate level of investment for the level of longevity needed. • **Relevance to MARSS:** Rulemaking support is not time-limited, so a robust, extensible design is worth the expended resources. A quick and dirty solution is not appropriate for MARSS.	• **Can be evaluated for longevity, but control lies with vendor.** A purchased product can be evaluated for longevity. Industry-leading products are likely to be robust and built with longevity in mind, as the product vendor's longevity is depending on the longevity of their products. However, control lies with the vendor. And, robust, extensible products tend to be more expensive. • **Relevance to MARSS:** The cost of a robust, industry-leading product is appropriate for MARSS, as the need is not time-limited.

Consideration	Build	Buy
Customization Implications	• **Freedom to design to need.** A build solution provides the freedom and ability to design and enhance features and capabilities specific to and responsive to the need. • **If customizations are anticipated, this is a reason to build.** Customization needs are a key consideration when deciding whether to build or buy. If customizations are anticipated, a build solution is the better option. If compromises to business processes and information needs can be made to adapt to a purchased product, a buy solution would be a good option. • **Relevance to MARSS:** Because rulemaking is regulated by Statute, the ability to deviate from this statutory process is not an option. A product that does not naturally support the process would lead to customizations of a purchased product. Customizations of purchased products are generally discouraged in the technology industry. Some customizations are anticipated for MARSS, so a build solution is the better option based on this one criterion.	• **Some benefits of purchasing are nullified by customization.** Some of the benefits of purchasing a product can be nullified by customizing the product. For example, the need to have internal or contracted technical expertise and skill would still be required. And, customization might result in a stepping away from industry standards and best practices which were originally baked into the product. Also, a product vendor might have contract terms that absolve them from impacts to performance or capabilities if customizations are made. • **A customized product can realize both the benefits of a purchased product plus custom capabilities, but complexities arise.** A product not naturally supporting a business process leads to customizations. Customizations deliver the benefits of the purchased product in addition to custom capabilities, but behind-the-scenes complexities need to be resourced and managed effectively to ensure business support is not compromised. One complexity is that upgrades or patches might negatively impact modified modules. Or, upgrades and patches may not be able to be applied to modified modules. Another complexity is that the ability to extend or scale a purchased product may be hampered because of customizations. A product that has not been customized is the design basis for new purchasable components and upgrades that support growth. • **A purchased product fits settings where processes can adapt.** In settings where adjustments to business processes can be accepted to adapt to software, customizations are more likely to be avoidable. In these settings, best practices may be infused to produce improved processes because of the adaption to an industry-leading product. However, a software product driving business process should cause trepidation and the impact should be carefully evaluated. • **Relevance to MARSS:** The rulemaking process is regulated by Statute and adjustments to this process to adapt to a product are not possible. Customizations that are not able to be made for critical business activities might introduce manual and inefficient steps. This setting is not well suited for a purchased product that would require customizations.

Consideration	Build	Buy
The Configurability of the Solution	• **Flexible, configurable software is dependent on the technical team's abilities.** The ability to flexibly configure software built in-house is dependent on the internal staff's ability to design and build for configurability. • **Select configurable components are purchasable to augment a build where it makes sense to do so.** The ability to design for configurability is achievable for some purposes. However, if the resources to build a highly configurable component is not worth the investment and this component is purchasable, augmenting a build with purchased configurable components is a good option. • **Relevance to MARSS:** With a build, purchased configurable components such as workflow and notifications are expected.	• **Typically built for configurability to meet multiple customer needs.** Industry-leading products are typically built with configurability in mind given the motivation to flexibly provide a product to meet multiple customer needs in an industry. • **A purchased product is a good option when a highly configurable product that meets core requirements without customizations is available.** A highly configurable product that meets the core business and technical requirements without customizations would be the scenario where a purchased product would be a good option. • **Relevance to MARSS:** None of the evaluated products during the pilot fully met all requirements through available configurations. Customizations would be needed.
Growing MARSS Capabilities Over Time	• **Easier to grow capabilities over time, especially with regular enhancements.** A build solution provides the flexibility to extend, grow and refine software capabilities over time as the code and design are within the internal staff's control. However, the greater the gap between enhancements, the more challenging the updates are likely to be. • **Dependent on staff's ability to build for growth.** The ability to build flexible software that changes gracefully over time is dependent on the internal staff's ability to design and build for extensibility. • **Relevance to MARSS:** Growth in capabilities could be achieved through code enhancements or through purchased products added to the build. Anticipating, analyzing, and designing broadly and implementing narrowly would be an advisable approach given a hybrid solution.	• **Products usually have growth / sales in mind.** Industry-leading products are often built with extensibility and modularity in mind given the motivation to remain relevant and viable as an industry changes and to continue to provide additional value, through additional products and modules, to customers. • **Some base components might not bring immediate value.** The purchase of a base level capability to support future enhancements or module purchases might be necessary without immediately derived value from all components of the purchase. • **No customizations ensure compatibility with modules over time.** A plan to purchase new components over time make it important to limit customizations to ensure compatibility with new components. If customizations can be eliminated or reduced, the ability to grow over time with a purchased product is a more viable solution. • **Relevance to MARSS:** Customizations are expected with MARSS. Challenges in growing MARSS capabilities are therefore expected with a buy. Also, up-front costs for base capabilities without immediate value are expected.

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Speed to Delivery of Realized Solution	• **Defer requirement detail work for build.** Detailed requirements through elaboration and design can be incorporated into software development, saving requirements elaboration time up front. • **Development and testing will take longer than with the implementation of a purchased product.** Development and testing will take longer with a build than with the implementation of a purchased product. • **Relevance to MARSS:** The requirements already defined are nearly adequate for development, except for the need to make determinations regarding the identified requirement gaps and for the need to determine priorities and phasing.	• **Requirements not defined and evaluated up front present a risk of a "gotcha" later.** Because a purchasable product should be evaluated on its ability to meet current and future requirements, any requirement not evaluated presents a risk of being a "gotcha" later. Therefore, ensuring requirements are solid prior to selecting a product is more important with a buy than a build. • **Time is saved later as product is already built and bug fixes are likely resolved.** Time is saved later during the implementation of a purchased product given that a purchased product is already built and bug fixes have more likely been resolved. • **Relevance to MARSS:** More detail defined by the workgroup is needed for a purchased product in addition to addressing the identified requirement gaps and determining priorities and phasing. This will ensure that the purchase is made based on an assessment of the best fit for now and into the future.
Expertise in Business Domain	• **Technology staff has intimate understanding of business domain.** Unique business domain expertise specific to the setting exists in-house with the Revisor's Office technical team. • **Other states are unique in rulemaking, which supports the case for a build as a common product does not exist.** Research of the solutions employed by other state entities who are responsible for managing administrative rules revealed unique manifestations and a range of manual and automated supports for rulemaking. • **Relevance to MARSS:** The Minnesota Revisor's Office supports a unique business domain and is staffed by technology staff with an intimate understanding of this business domain. The existing custom technology team is well suited to support a custom build with additional staffing.	• **Industry knowledge / best practices baked into vendor products specializing in business domain, when applicable.** Industry knowledge and best practices expertise for a business domain exists for vendors specializing in a particular business domain. • **Relevance to MARSS:** The desired system's specifications include general industry capabilities of document/content management, workflow management, and notifications which are well-developed capabilities in the software industry. However, general widely-adopted software specific to rulemaking is not available.

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Expertise and Skill in Delivering Desired Software Capabilities	• **Technical team has expertise/skill per unique history and supported software.** The in-house technical team brings expertise and skill based on their unique history and currently supported software, but the team may not have developed expertise or skill in specific types of software capabilities, such as configurable workflow or rules engines. • **Relevance to MARSS:** The in-house technical team has built software and continues to maintain, enhance and support this software, in addition to maintaining purchased components. Some capabilities of MARSS, such as a workflow engine or advanced content/document management, might be best provided via a purchased add-on should the build solution option be chosen. In this case, a build should be developed in anticipation of purchased components. In addition, a build solution would require that additional staff resources be secured to ensure that the necessary expertise, skill and bandwidth is resourced for MARSS development.	• **Software products should be selected for proven capabilities.** Software products can be selected for their proven capabilities, such as configurable workflow or rules engines. • **Relevance to MARSS:** The evaluated products were chosen during the pilot due to their fit for meeting the requirements, with near-term and over time requirements and business and technical requirements in mind. An exact fit was not identified, but products that met most of the requirements were identified. A purchased product would still require new technology knowledge and skills of internal staff to configure the software in combination with customizations and integrations.
Access To and Control Over Data	• **Data access and control is within responsibility of and dependent on the technical team's skill.** With a build, data access and control is completely within the responsibility of internal staff and dependent on the data management knowledge and skills of internal staff. • **Relevance to MARSS:** The access to and control over data is a key consideration and a reason to build in-house. Given that MARSS will store official and legally-binding rulemaking records forever, complete access to and control over the data and documents would be a prudent choice.	• **The native database design and controls of a product might create data access and control challenges.** Access and control of data is within the responsibility of internal staff with a purchased product, however, the native database design and controls might limit the ways in which internal staff can access or control data and present challenges. Some difficulties in meeting information needs of the business may result. Careful consideration of a product's ability to meet information needs in addition to functional and non-functional needs is important, including the configurability of data structures and application fields. • **Relevance to MARSS:** If a purchased product is chosen for MARSS, it is especially important that all desired access to and control over data is not hampered by the native design limitations of a purchased product. The ability to configure data structures and application fields is an important consideration to explore with a product vendor.

Consideration	Build	Buy
The Technical Team's Support for MARSS	• **Support can be provided directly by the technical team, which has deep knowledge and expertise of MARSS and users.** Support can be provided directly by the internal technical team if a build is chosen, as the team would have deep knowledge and expertise of the software system and the stakeholder needs. • **Technical team already providing support for rulemaking. Support would expand for devoted team.** Internal Revisor's Office technology staff is already providing support for rulemaking. Support would expand for this devoted team with a built solution, which would require additional staff resources. • **The expertise and capabilities of the technical team are being built along with the software system, producing a powerful team to maintain, enhance and provide support for the system.** By building the solution in-house, the expertise and capabilities of internal staff are being built along with the software system, producing a powerful team to maintain and enhance the product. • **Relevance to MARSS:** The in-house staff already has a base of built and purchased software relevant to this business domain and is already a custom team supporting the technology needs related to Statutes, Laws and Rules. It makes sense to continue to build this team for this custom purpose. The need for additional staff resources for a build is slightly higher than the need with a purchased product.	• **Support is often provided by an external vendor, or by internal staff who are reliant on an external vendor as second tier support.** With a purchased product, support is often provided by an external vendor, or by internal staff who are then reliant on the external vendor as second tier support. • **The evaluation of the support model and the vendor service level agreement is important.** The evaluation of the support model and service level agreement with the vendor that would exist with a purchased product is important to consider prior to the purchase to ensure that the reliance on an external vendor does not result in poor or delayed support. • **The need for new technical skills and the level of staffing to provide support are still affected with a purchased product.** The technical team would need to be resourced appropriately for a purchased product. They would also need to build their technical skill and expertise in the configuration of the purchased product and in the support of customizations and integrations. • **Relevance to MARSS:** The ability of business stakeholders to configure a purchased product directly without assistance from technology staff is a desirable capability for some products. However, the infrequency of the anticipated interactions with the MARSS system along with the expectation that some level of technical understanding will be needed to perform the configurations of the system are reasons to task the Revisor's Office technical team with the configuration tasks of a purchased product. Additional staffing is needed.

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Dependency on Vendor	• **Eliminates dependency on vendors, or reduces dependency to select purchased components.** A build would eliminate a dependency on external vendors, or reduce the dependency to select purchased components. Source code is also owned. The dependency of a built solution would be on internal staff, which brings different risks than would be introduced by an external vendor. • **Relevance to MARSS:** Careful consideration of the necessary staff resources is needed for a build. And, the careful evaluation of any purchased components along with an evaluation of vendors is still needed with a build/buy hybrid solution. But, an external dependency would be less than with a buy.	• **Support and maintenance of a product is dependent on the solvency and decisions of the software vendor.** Support and maintenance of a purchased product is dependent on the solvency of the software company and the external vendor (the same or different). Support can be delayed and the vendor's support timeline might not meet the level of urgency of the need. The vendor's range of products and services along with the possibility of larger or higher priority customers might impact the level of service provided. Another consideration is the loss of support. Source code ownership or access to code can be negotiated per contract, however, unsupported software in production is a risk of an external dependency on a vendor. A careful evaluation of the product and vendor along with careful contract negotiation would mitigate the risks inherent in purchasing a product. • **Relevance to MARSS:** A stronger external dependency would be created for MARSS with a buy. Careful evaluation of the product and vendor is needed, as well as careful negotiation of an agreement for support and maintenance.
Technical Environment Considerations	• **Leverages existing infrastructure.** A built solution can leverage existing infrastructure. Also, choices can be made based on platform and environment fit. • **Relevance to MARSS:** The Revisor's Office technology team already has a base environment to build from if a build is chosen. Extending from this base would be a natural progression and would leverage the current investment.	• **A buy can be chosen for environmental fit or the internal environment can adapt to product needs.** A purchased product can be chosen based on platform and environment fit, or the internal platform and environment could be adjusted or augmented to support the new product. • **Relevance to MARSS:** The evaluated products during the pilot are not all direct fits for the Revisor's Office technology stack but accommodations and adjustments can be made for the new technologies.
Cost	• **Costs relative to project needs.** The cost of a build and of additional purchased components are specific to the needs of the project. The ability to delay costly features until a future point in time is easier with a build or hybrid option. • **Relevance to MARSS:** The cost of a build would be spread over time.	• **There is a risk of overbuying up front, but ROI is experienced over time.** There is a tendency to overbuy with a purchased product because of what comes standard in a base product designed for longevity. However, there is a return on investment over time, as the product vendor is responsible for changes and enhancements. • **Relevance to MARSS:** The cost of a buy is higher up front.