# Architectural Pattern Selection – Evaluation Values for User Input


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# 1 Application Domain

Evaluation values for each application domain:

| ID | Domain | Layered | Event-driven | Micro-kernel | Micro-services | SOA | Space-based |
|---|---|---|---|---|---|---|---|
| **1.1** | Web-based systems | 5 | 5 | 0 | 5 | 5 | 5 |
| **1.2** | Web services | 0 | 0 | 0 | 5 | 5 | 5 |
| **1.3** | Service-based systems | 0 | 0 | 0 | 5 | 5 | 0 |
| **1.4** | Distributed systems | 5 | 5 | 5 | 5 | 5 | 5 |
| **1.5** | Cloud computing applications | 0 | 0 | 0 | 5 | 5 | 0 |
| **1.6** | Mobile applications | 5 | 0 | 0 | 5 | 5 | 5 |
| **1.7** | Compiler design | 5 | 0 | 0 | 0 | 0 | 0 |
| **1.8** | Case and related developer tools | 5 | 5 | 5 | 5 | 0 | 0 |
| **1.9** | Database systems | 5 | 5 | 0 | 5 | 0 | 0 |
| **1.10** | Context-aware systems | 5 | 5 | 0 | 5 | 5 | 0 |
| **1.11** | Adaptable systems | 0 | 0 | 5 | 5 | 0 | 0 |
| **1.12** | Enterprise application integration | 0 | 5 | 0 | 5 | 5 | 0 |
| **1.13** | Customer relationship management | 5 | 5 | 0 | 5 | 5 | 0 |
| **1.14** | Information management and decision support systems | 5 | 5 | 0 | 0 | 5 | 0 |
| **1.15** | Transaction Processing | 5 | 5 | 0 | 5 | 5 | 5 |

## 2 Type of Application

Evaluation values for each application type:

| ID | Description | Layered | Event-driven | Micro-kernel | Micro-services | SOA | Space-based |
|---|---|---|---|---|---|---|---|
| **2.1** | Web application / website with small components | 0 | 0 | 0 | 5 | 5 | 0 |
| **2.2** | Large scale web application like e-commerce or social website development | 5 | 5 | 0 | 5 | 5 | 5 |
| **2.3** | General desktop application | 5 | 5 | 5 | 0 | 0 | 0 |
| **2.4** | Application with a simple business logic that does not need to scale out | 5 | 5 | 0 | 0 | 0 | 0 |
| **2.5** | Enterprise or business application with traditional IT departments and processes | 5 | 0 | 0 | 0 | 5 | 0 |
| **2.6** | Application with a fixed set of core functionalities and a dynamic set of functionalities that need frequent updates | 0 | 0 | 5 | 5 | 0 | 0 |
| **2.7** | Large, complex, enterprise-wide systems that require integration with many heterogeneous applications and services | 0 | 5 | 0 | 0 | 5 | 0 |
| **2.8** | Application that has many shared components, particularly components across the enterprise | 0 | 5 | 0 | 0 | 5 | 0 |
| **2.9** | Application with immense and rapidly growing data systems | 0 | 5 | 0 | 5 | 0 | 5 |
| **2.10** | Application with different platforms | 0 | 0 | 0 | 5 | 5 | 0 |
| **2.11** | Application that requires strict standards of testability | 5 | 0 | 0 | 5 | 0 | 0 |

# 3 Non-Functional Requirements

Evaluation values for non-functional requirements:

| ID | NFR | Layered | Event-driven | Microkernel | Microservices | SOA | Space-based |
|---|---|---|---|---|---|---|---|
| **1** | Maintainability | 0,74 | 0,79 | 0,73 | 0,79 | 0,79 | 0,79 |
| **2** | Performance | 0,29 | 0,50 | 0,26 | 0,70 | 0,65 | 0,70 |
| **3** | Portability | 0,77 | - | 0,79 | 0,21 | 0,79 | 0,79 |
| **4** | Reliability | 0,75 | 0,79 | 0,79 | 0,79 | 0,73 | 0,64 |
| **5** | Security | 0,76 | 0,79 | 0,79 | 0,79 | 0,65 | 0,5 |

| ID | NFR | Layered | Event-driven | Microkernel | Microservices | SOA | Space-based |
|---|---|---|---|---|---|---|---|
| **3.1** | Maintainability | 5 | 5 | 5 | 5 | 5 | 5 |
| **3.2** | Performance | 2 | 3 | 1 | 4 | 4 | 4 |
| **3.3** | Portability | 5 | 4 | 5 | 1 | 5 | 5 |
| **3.4** | Reliability | 5 | 5 | 5 | 5 | 5 | 4 |
| **3.5** | Security | 5 | 5 | 5 | 5 | 4 | 3 |

Evaluation of specific NFRs regarding development and deployment:

| ID | Description | Layered | Event-driven | Microkernel | Microservices | SOA | Space-based |
|---|---|---|---|---|---|---|---|
| **4.1** | High ease of development / quick development with fewer developers | 5 | 0 | 0 | 5 | 0 | 0 |
| **4.2** | Easy to rewrite and update parts of the application | 0 | 0 | 5 | 5 | 0 | 0 |
| **4.3** | Development teams that are spread out | 0 | 0 | 0 | 5 | 0 | 0 |
| **4.4** | Adding special functionality, | 0 | 0 | 5 | 5 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | modules or extensions without rewriting the original application | | | | | | |
| **4.5** | High ease of deployment | 0 | 5 | 5 | 5 | 0 | 5 |
| **4.6** | Rapid, frequent and independent deployment | 0 | 0 | 0 | 5 | 0 | 0 |
| **4.7** | Quick response to a constantly changing environment | 0 | 0 | 5 | 5 | 0 | 5 |
| **4.8** | Reusability of integrations and component sharing | 0 | 0 | 0 | 0 | 5 | 0 |

# 4 Architectural Features

Evaluation of architecture features:

| ID | Description | Layered | Event-driven | Microkernel | Microservices | SOA | Space-based |
|---|---|---|---|---|---|---|---|
| **5.1** | Asynchronous communication / data flow | 5 | 5 | 5 | 5 | 5 | 5 |
| **5.2** | Synchronous communication / data flow | 5 | 0 | 5 | 5 | 5 | 0 |
| **5.3** | Loose coupling | 0 | 5 | 5 | 5 | 5 | 0 |
| **5.4** | Independent services | 0 | 0 | 0 | 5 | 5 | 0 |
| **5.5** | Separation of concerns | 5 | 0 | 5 | 5 | 5 | 0 |
| **5.6** | Plug-in components | 0 | 0 | 5 | 0 | 0 | 0 |
| **5..7** | Dynamic composition | 0 | 5 | 5 | 5 | 5 | 0 |
| **5.8** | High volume data | 0 | 0 | 0 | 5 | 0 | 5 |