

RATIONALE FOR
INTEGRATION CHECKLIST
FOR
MIGRATION ASSESSMENT

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Center for Integration
and Interoperability

Rationale for Integration Checklist for Migration Assessment: DATA

INTRODUCTION

The overall rationale behind the Integration Checklist for Migration Assessment is to measure migration potential for legacy applications. The questions which ask the respondent to list additional information help define the scope of the application.

I. Operational Functionality

1. Describe the formal data model supporting this application, i.e., logical.

Evaluation Criterion: Interoperability

If a data model supports more than one functional area or activity, then issues of standardization and interoperability have been addressed.

Source: TAFIM.

2. Describe how the data elements used by this application were developed or updated.

Evaluation Criteria: Interoperability, Efficiency

Data standardization is critical to cross-application and cross-functional integration. Standardization of data elements will result in efficiently storing data in databases and files through reduced redundancy. It makes data exchange more efficient by minimizing the need for extra reconciliation/manipulation/transformation steps.

Sources: TAFIM

DoD 8320.1
DoD 8320.1-M
DoD 8320.1-M-1.

3. Is at what level is the data managed?

Evaluation Criteria: Interoperability, Maintainability

The higher the organizational level at which data is managed, the broader the consistency and acceptance of that data. Applications that use data managed at a DoD level will almost certainly find it easier to exchange data than applications with data managed locally. Consolidation and interoperation are two critical near-term goals for data management in the DoD.

Sources: TAFIM.

4. Is information on the data elements (e.g., definition, format, valid values, ownership) stored in a data dictionary? If so, at what level is the dictionary managed?

Evaluation Criteria: Interoperability, Maintainability, Supportability

Data dictionaries provide ready access to information about data. This information is more accessible, more extensive, and easier to maintain in a data dictionary. The higher the organizational level at which the data dictionary is managed, the broader the consistency and acceptance of the information about data.

Sources: TAFIM
DoD 8320.1.

5. To what extent are quality standards enforced?

Evaluation Criterion: Interoperability

Enforcement of data quality standards is vital for establishing and maintaining the credibility of an organization's data. Poor data quality can be an expensive deterrent to cross-functional and cross-system integration.

Sources: Data Administration Strategic Plan.

II. Technical Questions

A. Data Integrity

1. Where is data quality checked by the application?

Evaluation Criteria: Supportability, Integrity

The closer to data entry that data quality is checked, the cheaper and easier it is to fix.

Sources: Not available.

2. Indicate which of the following automated data management features are captured by the application/DBMS:

Evaluation Criterion: Interoperability

Automated data management tasks are faster and more efficient than nonautomated ones.

Sources: Not available.

3. Indicate which of the following Database Utility services are supported by the system's infrastructure.

Evaluation Criterion: Interoperability

Database utility services provide the capability to retrieve, organize, and manipulate data extracted from a database management system. These common services provide a consistent interface to the user, while providing access to a variety of databases.

Sources: TAFIM.

4. To what extent does the data dictionary/directory system allow data administrators and information engineers to access and modify data about data (i.e., metadata)?

Evaluation Criteria: Interoperability, Maintainability, Flexibility

The ability to access and modify metadata allows data administrators and information engineers to evaluate and meet the changing needs of an organization.

Sources: Data Administration Strategic Plan.

5. When a user enters data using this application, are all files or databases associated with other applications that use this data updated automatically?

Evaluation Criteria: Usability, Integrity

A single point of entry to data saves time, and ensures integrity and consistency of data.

Source: DoD 8320. 1.

III. Data Handling

A. Data Recovery

1. Is there a documented Continuity of Operations Plan?

Evaluation Criterion: Reliability

A documented Continuity of Operations Plan can greatly facilitate the recovery of a system in the event of a failure.

Source: Not available.

2. Describe the application's database recovery capabilities in the event of a system failure.

Evaluation Criteria: Usability, Reliability

It is vital for a system to have backup and recovery services for its data, to minimize the consequences of a system failure.

Source: Not available.

Rationale for Integration Checklist for Migration
Assessment: APPLICATION

I. Operational Functionality

1. Describe this application's operational status. Indicate the best response.

Evaluation Criteria: Usability, Reliability

Systems that are currently operational are preferable as migration systems because they have already been tested and proven in one or more environments.

Source: DoD 8020. 1-M.

2. Describe the use of data generated by this application by individuals or AISs in other functional areas or activities. (See Attachment A for a list of Functional Areas and Activities.)

Evaluation Criteria: Interoperability

Determines if the application supports cross-functional capabilities. If the application cooperates with other functional activities, then it directly addresses issues related to integration. Evaluates output and use of internal data by other sources.

Source: TRM: An Open System operates with other application on local and remote systems.

3. Describe the use by this application of data generated by other functional areas or activities. (See Attachment A for a list of Functional Areas and Activities.)

Evaluation Criterion: Interoperability

Determines if the application supports cross-functional capabilities. If the application cooperates with other functional activities, then it directly addresses issues related to integration. Evaluates the source of input to the application.

Source: TRM: An Open System operates with other application on local and remote systems.

4. Does this application meet its current user response time requirement?

Evaluation Criterion: Efficiency, Usability

If the response time requirements are slow, then the system may not be meeting functional requirements. This requirement is the current user perceived need, not necessarily the requirement specified in the application documentation. It is also concerned with changes

to user requirements since the application was written.

Source: None

5. Is data required to be entered only once?

Evaluation Criteria: Usability

Applications that require the user of the least amount of data input are preferred .

Source: None.

6. Is all of the information that the user needs to perform the supported function provided by the application?

Evaluation Criteria: Usability

Applications that obtain input data with the least possible involvement from the user and technical support personnel are preferred. Data accessible to multiple applications at the greatest speed and efficiency are desirable.

Source: None.

7. Describe the "ease of use" of this application. This includes the use of standardized user interfaces, on-line help, quality user manuals, easy procedures for recovering from mistakes or processing failures, etc.

Evaluation Criterion: Usability

Applications that are easy to use are preferred.

Source: TAFIM: An easy-to-user application allows users to easily convert from one application to another with minimal difficulty or retraining.

8. Describe the training requirement for the effective use of this application by a functional user.

Evaluation Criteria: Supportability, Usability

Applications that are easy to learn are preferred.

Source: TAFIM

II. Technical Questions

1. Does the application have an explicitly defined and documented technical architecture?

Evaluation Criteria: Maintainability, Interoperability

The TAFIM mandates a well-defined technical architecture framework for interoperability and cross functional integration. This architecture can be followed more easily if it is clearly documented.

Source: TAFIM.

2. How old is the application's design?

Evaluation Criteria: Maintainability, Reusability, Portability, Interoperability

Applications with modern design techniques are more likely to meet TAFIM requirements.

Source: TAFIM.

3. When was the last major revision of this application?

Evaluation Criteria: Maintainability, Reliability

Applications with a recent major change in the source code will have a more recent technology base, possibly moving the application closer to OSE.

Source: None.

4. How modular is the software for this application? Select the best answer.

Evaluation Criteria: Reusability, Reliability, Supportability, Maintainability

Modularity is a desirable trait for migration systems because it facilitates understandability of the application and provides a better environment for software re-use.

Source: TAFIM.

5. How portable is the application?

Evaluation Criteria: Portability

Applications that have been proven to be portable are preferred as migration systems.

Source: TAFIM.

6. How scalable is the application? On how many of the three major types of computer systems (mainframes, minicomputers/workstations, and microcomputers) is the main portion of this application currently capable of operating?

Evaluation Criteria: Portability (Scalability)

Applications that have been proven to be portable on platforms of different sizes are preferred as migration systems.

Source: TAFIM.

7. What is the primary programming language of this application?

Evaluation Criteria: Maintainability, Supportability, Reusability

Some programming languages are preferred for DoD migration application because of their ability to be supported in the common DoD programming organizations and their features for software engineering of quality systems.

Source: TAFIM.

8. Is this application based on a client-server design?

Evaluation Criteria: Interoperability, Portability, Flexibility, Expendability, Reusability

Client-server applications are preferred as migration systems because of their migratability to OSE.

Source: TAFIM.

9. What is the operating system on the primary or most common platform where the application is hosted?

Evaluation Criteria: Interoperability, Portability, Reusability

Applications that operate on platforms with operating systems that are more closely compliant with OSE standards are preferred.

Source: TAFIM.

10. Describe the security environment of this application with respect to unclassified but sensitive data.

Evaluation Criterion:: Security

Applications with internal support for control of sensitive data are preferred.

11. *Source:* Defense-wide Information System Security Program (DISSP) Goal Security Architecture.
Describe the security environment internal to this application with respect to classified data.

Evaluation Criterion:: Security

Applications that have the capability to support all security requirements of the supported function are preferred.

Source: Defense-wide Information System Security Program (DISSP) Goal Security Architecture.

12. Describe the access controls which are internal to this application.

Evaluation Criterion:: Security

Applications that support access to the supported functions based on the user's authorization to execute specific operations is preferred. These applications distinguish between users with different privileges.

Source: Defense-wide Information System Security Program (DISSP) Goal Security Architecture.

13. Describe the audit trail environment of this application.

Evaluation Criteria: Security, Reliability

Applications that provide an audit trail of all security-relevant actions by users are preferred.

Source: Defense-wide Information System Security Program (DISSP) Goal Security Architecture.

14. During the last 12 months, how many defects have been identified?

Evaluation Criteria: Maintainability, Reliability

Applications with fewer defects are preferred because they require less maintenance effort and give more dependable support to the user.

Source: None.

15. During the last 12 months, how long has it taken, on average, to service requests for problem fixes?
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Evaluation Criteria: Supportability, Maintainability, Reliability

Applications with good programming support for existing requirements are preferred.

Source: None.

16. During the last 12 months how long has it taken, on average, to correct defects in the latest release of the application.

Evaluation Criteria: Supportability, Maintainability, Flexibility

Applications with good programming support for existing requirements are preferred.

Source: None.

17. Are different versions of this application in use on compatible platforms?

Evaluation Criteria: Maintainability, Supportability

This is an indication that there are serious portability or functional support issues which require different versions of this application on similar platforms. The application may not be able to support different user communities. This environment is much harder to support.

Source: None.

18. How many people (including contractors) spend one third or more of their time supporting the maintenance of software for this application?

Evaluation Criterion: Supportability

Applications that require fewer people to provide programming support are preferred.

Source: None.

19. Describe the training environment provided for use of this application. Do not consider training for the functional process. Consider only training for the use of this application.

Evaluation Criteria: Supportability, Usability

Applications with a established training support in place are preferred.

III. Data Handling

1. Describe the dominant data environment for this application.

Evaluation Criteria: Interoperability, Integrity, Efficiency, Maintainability,

Supportability

Applications with database management systems and more mature data handling environments are preferred.

Source: TAFIM, APP.

2. Describe the data retrieval environment of this application.

Evaluation Criteria: Interoperability, Integrity, Efficiency, Maintainability, Supportability

Applications with SQL and modern data retrieval capabilities are preferred.

Source: TAFIM, APP.

3. Describe the data dictionary used by this application.

Evaluation Criteria: Interoperability, Integrity, Maintainability, Supportability

Applications with mature commercial data dictionaries are preferred because they enhance the DBMS functions and promote the use of the data between applications.

Source: TAFIM, APP.

4. What is the primary means that this application receives data from other automated applications?

Evaluation Criteria: Interoperability, Flexibility, Availability

Applications that obtain input data with the least possible involvement from the user and technical support personnel are preferred. Data accessible to multiple applications at the greatest speed and efficiency are desirable.

Source: None.

5. What is the primary means that data from this application is transferred from other automated systems?

Evaluation Criteria: Interoperability, Flexibility, Availability

Applications in which output data is made available with the least possible involvement from the user and technical support personnel are preferred. Data accessible to multiple applications at the greatest speed and efficiency are desirable.

Source: None

6. Is newly entered data validated prior to updating the associated database?

Evaluation Criteria: Integrity

Applications that validate input data early in the data entry process so that corrections can be made prior to writing to the database are preferred.

Source: None.

7. Describe the data processing environment with respect to the timing of database updates and initial data entry.

Evaluation Criteria: Integrity, Recoverability, Timeliness

Applications that provide the most recent data and transactions completed in the most expedient manner are preferred.

Source: None.

IV. Programmatic Questions

A. Life Cycle Issues

1. Describe the life-cycle management plan (LCMP) for this application.

Evaluation Criteria: Maintainability, Supportability

Applications with complete and standard LCMPs are preferred.

Source: TAFIM and referenced DoD standards documents.

2. Described the funding status of this application.

Evaluation Criterion: Supportability

Applications with complete funding status are preferred. Participation in the strategic IRM planning and budget planning processes helps ensure that the application supports functional and enterprise-wide goals, and is funded long-term.

Source: DoD 8020.1 -M

3. Identify potential restrictions for expanded government use of this application.

Evaluation Criteria: Acquirability, Expendability

Applications that have cost or other restrictions to expansion will be less favorably considered as migration applications. These costs will be evaluated at part of all alternatives.

Source: None.

4. Are there contractual issues associated with this application that would prevent or limit its replacement by another system if it were not selected as part of the migration system for this Functional Activity?

Evaluation Criterion: None

Restrictions or additional costs associated with cancellation or replacement of an application will be evaluated with all other costs of selecting a migration application.

Source: None.

5. Who is providing the primary support to this application? Choose Contractor if a civilian contractor is performing the work, even if a CDA or other activity is monitoring the contract.

Evaluation Criteria: Maintainability, Supportability

Applications that are supported by CDAS, contractors, and other programming organizations are preferred. Environments with mature software engineering practices and conformance with DoD standards are more prevalent in those environments.

Source: None.

6. Describe the business process documentation which this application supports. Respond with the first answer that applies.

Evaluation Criteria: Functional Efficiency

Applications that have completed an evaluation of the supported business process are preferred. They are more likely to be integrated well with other applications and it is easier to capture requirements for new functional tasks.

Source: DoD 8020.1-M.

7. Does the technical documentation of this application conform to standards?
- A. Yes, it is fully documentation according the applicable military standard, e.g. 7935, 2167-A or 498.
 - B. It is fully documented but not completely according to the applicable military standard.
 - C. It used the applicable standard but is at least partially incomplete.
 - D. It is partially documented but not in the form specified by the applicable military standard.
 - E. There is nor formal documentation of the type specified in the military

standards.

F. Other . (Explain).

8. Describe the specification of the functional requirement for this application.

Evaluation Criterion:: Supportability

Applications that have had a formal specification of requirements are preferred. They are more likely to have a comprehensive software engineering environment throughout their life cycle. They are more likely to offer complete support to the specified functional task.

Source: Referenced DoD standards documents.

9. How current is the technical documentation of the application code and data?

Evaluation Criteria: Maintenance, Supportability

Applications with the most current documentation are preferred.

Source: Referenced DoD standards documents.

10. Describe the current status of the economic analysis of this application?

Evaluation Criterion: Supportability

Applications that have completed a financial evaluation of the supported business process and the technical alternatives for support are preferred. They are most likely to be providing effective and efficient technical support.

Source: Referenced DoD standards documents.

**Rationale for Integration Checklist for Migration
Assessment: INFRASTRUCTURE**

I. Operational Functionality

A. Design Considerations

1. What level of technical support of functional integration is used by this system?

Evaluation Criteria: Interoperability, Portability, Usability, Deployability, Supportability, Acquirability, Expendability, Command and Control

The TAFIM mandates the use of fully integrated systems within DoD. Individual systems are evaluated relative to the hierarchy specified in the TAFIM. Systems that provide a more complete level of functional integration will be considered better candidates for migration than those with a less complete level of functional integration.

Source: TRM, TAFIM, TIPAF, DOD 8020.1-M, C41FTW.

2. Indicate the level to which the system's infrastructure supports its current functional requirements.

Evaluation Criteria: Supportability, Command & Control

Systems that do not support the current mission of the functional activity or mission area will not be considered for migration.

Source: TRM, TAFIM, TIPAF, C41FTW.

3. Identify the computing design structure supporting this system.

Evaluation Criteria: Portability, Interoperability, Deployability, Supportability, Command & Control

The TAFIM recommends that systems use the distributed computing model. Applications that are not based on the distributed computing model are less likely to be considered as candidates for migration.

Source: TRM, TAFIM, TIPAF, DoD 8020.1-M, C41FTW.

4. Specify the level of support provided to meet the user's training requirements for this system.

Evaluation Criteria: Supportability, Efficiency, Deployability, Availability,
Rationale-15

Command & Control

Systems that do not have sufficient capacity to support integrated training capabilities will not be considered as candidates for the migration system.

Source: TRM, TAFIM, TIPAF, C41FTW.

5. Identify the consistency of the system's user interface, i.e., the "look and feel," across various platforms and devices.

Evaluation Criteria: Interoperability, Portability, Supportability, Expendability, Flexibility, Deployability, Command & Control

Systems that support a consistent user interface across various platforms will be considered better candidates for migration than those that provide significantly different user interfaces across platforms.

Source: TRM, TAFIM, TIPAF, DoD 8020.1-M, C41FTW.

6. Identify which of the following functional services specified in the TAFIM are supported by this system.

Evaluation Criteria: Interoperability, Portability, Deployability, Supportability, Flexibility, Command & Control

Systems that do not support all of the identified services will not be considered as good a candidate for migration as those that do support all of these mandated services.

Source: TRM, TAFIM, TIPAF, DoD 8020.1-M, C41FTW.

II. Technical Questions

1. Indicate which of the following network services are supported by the system's infrastructure.

Evaluation Criteria: Interoperability, Portability, Deployability, Command & Control

Systems that do not support the open systems requirement for network interface will not be considered for selection as the migration system. Systems that do support the specified network protocols will be considered before any systems relying on proprietary protocols.

Source: TRM, TAFIM, TIPAF, DoD 8020.1-M, C41FTW.

2. Specify which of the following security services are supported by the system's infrastructure.

Evaluation Criteria: Deployability, Command & Control
Systems that do not support all of the TAFIM mandated security services will not be considered for selection as the migration candidate.

Source: TRM, TAFIM, TIPAF, C41FTW.

3. Describe the security environment where the application is hosted.

Evaluation Criterion:: Security

Applications that are operating in an environment with a developed ability to process classified data are preferred.

Source: Defense-wide Information System Security Program (DISSP) Goal Security Architecture.

4. Which of the following systems level management services are provided?

Evaluation Criteria: Interoperability, Supportability, Portability, Deployability, Command & Control

Determines which types of TAFIM mandated systems management services are supported by the system being assessed.

Assumptions: Systems that support all of the TAFIM mandated systems-level management services will be considered better migration candidates than those that do not support all of these service types.

5. Indicate which of the following communications services are supported by the system's infrastructure.

Evaluation Criteria: Interoperability, Portability, Expendability, Availability, Deployability, Command & Control

Determines which of the TAFIM mandated communications services are supported by the system being evaluated. Systems that do not support all of the TAFIM mandated communications services will not be considered for migration.

Source: TRM, TAFIM, TIPAF, DoD 8020.1-M, C41FTW.

6. Indicate the reliability measures employed in support of the system's infrastructure.

Evaluation Criteria: Maintainability, Recoverability, Deployability

Systems with the highest level of reliability support will be considered better migration candidates than those with lower levels.

Source: TRM, TAFIM, TIPAF.

III. Data Handling Services

1. Which of the following data handling services are provided?

Evaluation Criteria: Interoperability, Reusability, Portability, Recoverability, Usability, Deployability,
Command & Control

Systems that support both types of TAFIM mandated data handling services will be considered better migration candidates than those that do not.

Source: TRM, TAFIM, TIPAF, DoD 8020.1-M, C41FTW.

IV. Programmatic Questions

A. Contractual Issues

1. How is the communications infrastructure provided?

Evaluation Criteria: Availability, Acquirability, Deployability

Systems that rely on wholly leased facilities will not be considered for migration. Systems whose communications infrastructure is wholly government owned will be considered better migration candidates than those with mixed own/lease.

Source: TRM, TAFIM, TIPAF, DoD 8020.1-M.

2. How is the hardware and system software provided?

Evaluation Criteria: Availability, Acquirability, Deployability

Systems that rely on wholly leased facilities will not be considered for migration. Systems whose communications infrastructure is wholly government owned will be considered better migration candidates than those with mixed own/lease.

Source: TRM, TAFIM, TIPAF, DoD 8020.1-M.

3. How are technology upgrades incorporated into the overall program?

Evaluation Criteria: Acquirability, Supportability, Expendability, Usability, Deployability, Command and Control

Systems whose contractual vehicles do not currently include provisions for incorporating technology upgrades into them will not be considered for migration.

Source: TRM, TAFIM, TIPAF, DoD 8020.1-M, C41FTW.

Reference List

1. Department of Defense Technical Architecture Framework for Information Management Vol 2 (TRM), and Volume 3 (Architecture Concepts and Design Guidance). Version 2.0, June 22, 1993.
2. Application Portability Profile - U.S. Government's Open Systems Environment OSE/1 Version 2.0 May, 1993.
3. C41 for the Warrior, Released by Joint Chiefs, 12 June 1992.
4. DoD 8320. 1, Data Administration, September 26, 199 1.
5. DoD 8020. 1 -M Functional Process Improvement, August 1992.
6. Tactical Integration Plan Analysis Framework, May 1993.