

Data Management Maturity Assessment (DMMA)

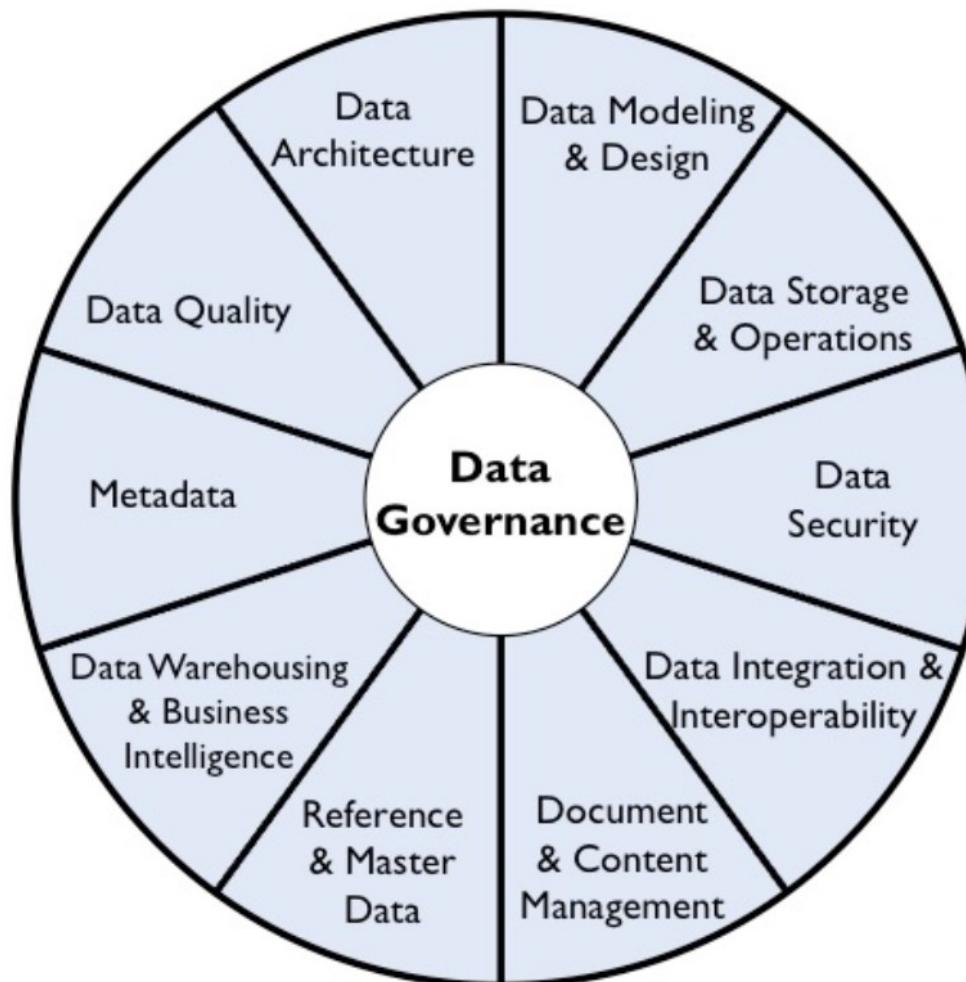
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1 Introduction

1.1 Data Management Knowledge Areas



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The DAMA Wheel

1.2 Capability Maturity Assessment (CMA)

- A CMA is a formalized way to evaluate the capability level of processes in an organization.
- It is based on a Capability Maturity Model (CMM) - a framework.
- Initially applied to software development, CMMs have been developed for a range of other fields, including data management.

2 Essential Concepts

2.1 Capability Levels

- CMMs defines progress through levels that describe process characteristics.
- With each new level, process execution becomes
 - more consistent
 - predictable, and
 - reliable
- Progression happens in a set order - no level can be skipped.

2.2 Common Capability Levels

- **Level 0:** Absence of capability
- **Level 1:** Initial or Ad Hoc. Success depends on the competence of individuals.
- **Level 2:** Repeatable. Minimum process discipline is in place.
- **Level 3:** Defined. Standards are set and used.
- **Level 4:** Managed. Processes are quantified and controlled.
- **Level 5:** Optimized. Process improvement goals are quantified.

2.3 Data Management Maturity Assessment (DMMA)

- A method for ranking practices for handling data within an organization to characterize the current state of data management and its impact on the organization.
- A DMMA can be used to evaluate data management on the organizational level, but also focus on a single knowledge area or even a single process.
- The first step is to establish a baseline of the organization's current state regarding
 - capabilities
 - assets
 - goals, and
 - priorities
- This means that a certain level of organizational maturity is required before even starting a DMMA.

2.4 Business Drivers

- Organizations conduct maturity assessments for a number of reasons:
 - Regulation
 - Data Governance
 - Organizational readiness for process improvement
 - Organizational change
 - New technology
 - Data management issues

2.5 Goals and Principles of a DMMA

- The primary goal of a DMMA is to evaluate the current state of data management activities, in order to plan for improvement.
- It clarifies the strengths and weaknesses in the organization, and helps with identifying, prioritizing, and implementing improvement opportunities.

2.6 Positive Impact on Culture

- A DMMA that meets its primary goal helps:
 - Educate stakeholders about data management concepts, principles and practices.
 - Clarify stakeholder roles and responsibilities in relation to organizational data.
 - Highlight the need to manage data as a critical asset.
 - Broaden recognition of data management activities across the organization.
 - Contribute to improving the collaboration necessary for effective data governance.

2.7 A Deeper Look at Capability Levels

- This is a generic summary of the levels that commonly describe different process characteristics.
- A detailed assessment would handle sub-categories such as
 - strategy
 - policy
 - standards
 - role definition, etc.,
- within each of the Knowledge Areas.

2.7.1 Level 0: No Capacity

- No organized data management practices.
- Very few organizations exist at this level.

2.7.2 Level 1: Initial/Ad Hoc

- General-purpose data management using a limited tool set.
- Little or no governance.
- Highly reliant on a few experts.
- Roles and responsibilities are defined in silos.
- Data owners receive, generate and send data autonomously.
- Controls are applied inconsistently - if they exist at all.
- Limited solutions for data management.
- Data quality issues are pervasive but not addressed.

2.7.3 Level 2: Repeatable

- Emergence of consistent tools and role definitions.
- Centralized tools are being implemented.
- More oversight for data management is provided.
- Processes are not dependent on specific experts.
- Organizational awareness of data quality issues and concepts.
- Master and Reference Data concepts are being recognized.

2.7.4 Level 3: Defined

- Emerging data management capability.
- Scalable data management processes are introduced and institutionalized.
- Data management is seen as an organizational enabler.
- Data is replicated across the organization with some controls in place.
- General increase in overall data quality.
- Coordinated policy definition and management. This leads to a significant reduction in manual intervention.
- Process outcomes are more reliable.

2.7.5 Level 4: Managed

- Growth in levels 1-3 enables the organization to predict results when approaching new projects and tasks, and begin to manage risks related to data.
- Data management includes performance metrics.
- Standardized tools for data management, from desktop to infrastructure.
- A well-formed, centralized planning and governance function.
- Measurable increase in data quality.
- Organization-wide capabilities such as end-to-end data audits.

2.7.6 Level 5: Optimization

- Highly predictable data management practices due to process automation and technology change management.
- Focus on continuous improvement.
- Tools enable a view of data across processes.
- Proliferation of data is controlled to prevent needless duplicates.
- Well-understood metrics are used to manage and measure data quality and processes.

2.8 Assessment Criteria

- Different processes have different assessment criteria that must be met for a process to reach a certain capability level.
- At any level, assessment criteria will be evaluated along a scale, such as:
 1. Not started
 2. In process
 3. Functional
 4. Effective
- showing process within that level and movement towards the next level.

2.9 Examples of Criteria Categories

- Criteria could be formulated based on the following categories:
 - Activity
 - Tools
 - Standards
 - People and resources
- The categories are based on the DAMA DM-BOK Context Diagram, which we will talk about in another lecture.

2.9.1 Activity

- To what degree is the activity or progress in place?
- Are criteria defined for effective and efficient execution?
- How well defined and executed is the activity?
- Are best practice outputs produced?

2.9.2 Tools

- To what degree is the activity automated and supported by a common set of tools?
- Is tool training provided within specific roles and responsibilities?
- Are tools available when and where needed?
- Are they configured optimally to provide the most effective and efficient results?
- To what extent is long-term technology planning in place to accommodate future state capabilities?

2.9.3 Standards

- To what degree is the activity supported by a common set of standards?
- How well documented are the standards?
- Are standards enforced and supported by governance and change management?

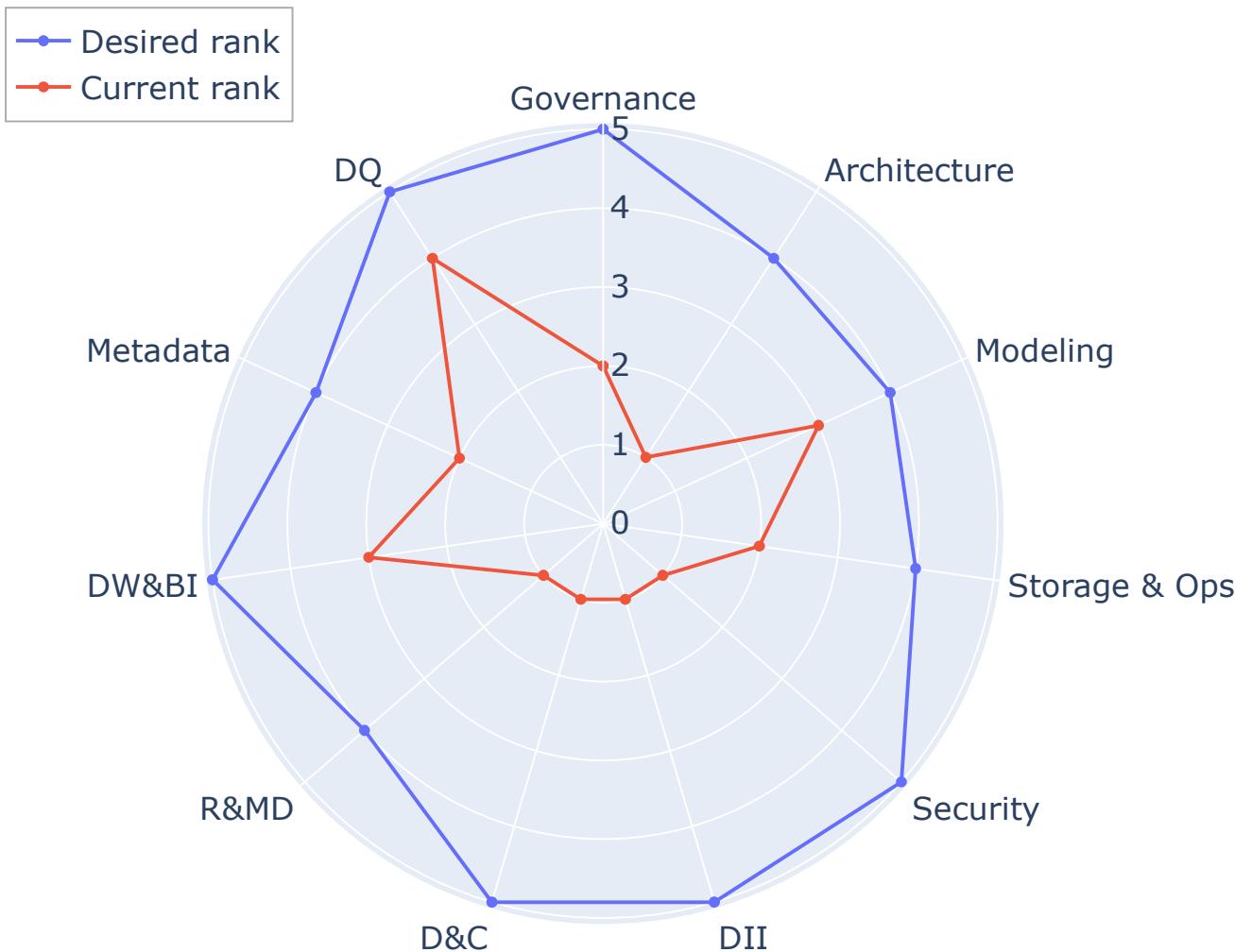
2.9.4 People and Resources

- To what degree is the organization staffed to carry out the activity?
- What specific skills, training, and knowledge are necessary to execute the activity?
- How well are the roles and responsibilities defined?

2.10 DMM Assessment Chart

- The findings can be visualized through a DMM Assessment Chart. (See next slide.)
- The outer ring shows the level of capability the organization has determined it needs to compete successfully.
- The inner ring shows the current capability level of the organization.
- The areas where the distance is largest represents the greatest risks for the organization.

2.11 DMM Assessment Chart (example)



DMM Assessment Chart (DAMA-DMBOK, p. 506)

2.12 DMM Frameworks

- There exists a number of data management maturity frameworks.
- Some are more general, and some have a more industry-specific focus.
- Most frameworks address subjects that can be mapped to the DAMA-DMBOK Knowledge Areas.
- Organizations should evaluate several models before choosing a framework, or choosing to develop their own.

2.12.1 CMMI Data Management Maturity Model (DMM)

- The CMMI-DMM provides assessment criteria for the following data management areas:
 - Data Management Strategy
 - Data Governance
 - Data Quality
 - Platform and Architecture
 - Data Operations
 - Supporting Processes
- The model identifies sub-processes to evaluate for each area, such as *Data Quality Strategy* and *Data Quality Assessment, Profiling, and Cleaning* within the Data Quality section.
- The model also accounts for the relation between the data management areas.

2.12.2 EDM Council DCAM

- The DCAM describes 37 capabilities and 115 sub-capabilities associated with the development of a sustainable Data Management program.
- Scoring focuses on the level of stakeholder engagement, formality of process, and existence of artifacts that demonstrate the achievement of capabilities.

2.12.3 IBM Data Governance Council Maturity Model

- The model is organized around four key categories:
 - **Outcomes:** Data risk management and compliance, value creation.
 - **Enablers:** Organizational structure and awareness, policy, stewardship
 - **Core disciplines:** Data Quality Management, information lifecycle management, information security and privacy
 - **Supporting Disciplines:** Data Architecture, classification and Metadata, audit information, logging and reporting.

2.12.4 Stanford Data Governance Maturity Model

- Developed for use by the Stanford University, and not intended to be an industry standard.
- The model focuses on data governance.
- Differentiates between the components:
 - foundational (awareness, formalization, Metadata), and
 - project (data stewardship, Data Quality, Master Data)
- Within each component, the model articulates drivers for people, policies, and capabilities, as well as characteristics for each level of maturity.
- The model provides both qualitative and quantitative measurements for each level.

3 Activities

- Performing a DMMA requires planning.
- Allow time within the plan for preparation of materials and evaluation of results.
- Keep the time allotted for the DMMA short and defined.
- The purpose of the evaluation is to expose current strengths and opportunities for improvement - **not to solve problems**.
- The goal is to reach a consensus view of current state capabilities, supported by evidence.
- Evidence may come from:
 - examining artifacts (e.g. the existence of database backups)
 - through interviews (e.g. verifying a certain responsibility is carried out)
 - or both
- Assessment can and should be scaled to fit the needs of the organization.
- However, keep the original intent of the model intact when customizing.

3.1 Plan Assessment Activities

- Define the overall approach.
- Communicate with stakeholders before and during the assessment to ensure they are engaged.
- The assessment itself includes:
 - collecting and evaluating inputs,
 - communicating results, recommendations and action plans.

3.1.1 Define Objectives

- The fact that a maturity assessment is being conducted means that the organization is already engaged in an effort to improve its practices.
- In most cases, those organizations have already identified the drivers for the assessment.
- These drivers must be clarified in the form of objectives that describe the focus and influence the scope of the assessment.
- The objectives must be understood by executives and align with the overall strategic direction of the organization.
- The objectives also give direction into which framework to choose, which business areas to evaluate, and who should give input.

3.1.2 Choose a Framework

- With the objectives clearly stated, review different frameworks to use.
- The choice of framework influences how the assessment is conducted.
- The team working on it should have expertise in the model and the methodology on which it depends.

3.1.3 Selecting a DMM Framework

- The following criteria should be considered when selecting a DMM framework:
 - **Accessibility:** Practices convey the functional essence of the activity
 - **Comprehensiveness:** Broad scope of DM activities, not just IT processes
 - **Extensible and flexible:** Can be used either in whole or in part
 - **Future progress path built in:** Logical way forward within each function
 - **Industry-agnostic vs. industry-specific**
 - **Level of abstraction or detail:** Sufficient to ensure criteria can be related to the organization
 - **Non-prescriptive:** Describes what needs to be performed, not how to perform it
 - **Organized by topic:** DM activities placed in appropriate contexts
 - **Repeatable:** Supports comparisons of results over time
 - **Supported by a neutral, independent organization:** Avoid conflict of interests, broad representation of industry best practices
 - **Technology neutral:** Focus on practices, not tools
 - **Training support included:** Enable professionals to master the framework

3.1.4 Define Organizational Scope

- Most DMMA Frameworks are designed to apply to an entire enterprise.
- This might be impractical, especially for a first evaluation.
- Rather, evaluation can be repeated for different parts of the organization - a so called localized assessment.

3.1.5 Localized and Enterprise Assessments

- Localized assessment:
 - Can go deep into details.
 - Can be done more quickly because of the smaller scope.
- Enterprise assessment:
 - Focus on the broad and sometimes disconnected parts of an organization.
 - Can be assembled from several localized assessments, or as a separate undertaking.

3.1.6 Define Interaction Approach

- Follow recommendations for the selected model.
- Information gathering activities may include
 - workshops
 - interviews
 - surveys
 - artifact reviews
- Employ methods that suit the organizational culture and minimize time commitment from participants.
- Responses will need to be formalized to fit the assessment criteria.

3.1.7 Plan Communications

- Communication will be directed at participants and other stakeholders.
- Findings may impact people's jobs, so it is important to communicate clearly about the purpose, process, and specific expectations for individuals and groups.
- Ensure participants understand the assessment model, as well as how the findings will be used.
- Before the assessment begins, stakeholders should be clearly informed about:
 - The purpose of the DMMA
 - How it will be conducted
 - What their involvement might be
 - The schedule of assessment activities
- Determine if the planned approach is likely to be successful across the targeted business scope, including factors such as resistance/cooperation, possible internal legal concerns, and possible HR concerns.
- The communications plan should include a schedule to report on findings and recommendations on all levels, including general reports and executive briefings.

3.2 Perform Maturity Assessment

3.2.1 Gather Information

- Gather appropriate inputs for the assessment, based on the interaction model.
- At a minimum, the information will include formal ratings of assessment criteria.
- It may also include input from:
 - interviews
 - focus groups
 - system analysis and design documentation
 - data investigation
 - procedure manuals
 - policies
 - approval workflows
 - Metadata repositories
- and more.

3.2.2 Perform the Assessment

- The participants will have different opinions, generating different ratings across assessment topics.
- The ratings will need to be reconciled, through discussion and rationalization.
- The goal is to come to a consensus view about the current state. This view should be supported by evidence.
- Without a consensus view of the current state, it is difficult to have a consensus view of how to improve the organization.

3.2.3 Refining Input Ratings

- The ratings refinement process usually works as follows:
 - Review results against the rating method and assign a preliminary rating to each work product or activity.
 - Document the supporting evidence.
 - Review with participants to come to consensus on a final rating for each area. If appropriate, use weight modifiers based on the importance of each criterion.
 - Document the interpretation of the rating using the model criteria statements and assessor comments.
 - Develop visualizations to illustrate results of the assessment.

3.3 Interpret Results

- Interpretation of the results consists of:
 - identifying improvement opportunities aligned with organizational strategy, and
 - recommending actions required to take advantage of these opportunities.
- When the assessment is complete, organizations need to plan for the target state that they aspire to achieve in data management.

3.3.1 Report Assessment Results

- The assessment report should include:
 - Business drivers
 - Overall results
 - Ratings by topic, with gaps indicated
 - A recommended approach to close gaps
 - Strengths of the organization as observed
 - Risks to progress
 - Investments and outcomes options
 - Governance and metrics to measure progress
 - Resource analysis and potential future utilization
 - Artifacts that can be used or re-used within the organization
- The report is an input to the enhancement of the Data Management program.

3.3.2 Develop Executive Briefings

- The assessment team should prepare executive briefings that summarize findings: strengths, gaps, and recommendations.
- The team must tailor the messages to clarify likely impacts and benefits for each executive group.

3.4 Create a Targeted Program for Improvements

- The DMMA should have a direct impact on data strategy and IT governance, as well as the Data Management program and strategy.
- Recommendations from the DMMA should be actionable, describing capabilities the organization requires.

3.4.1 Identify Actions and Create a Roadmap

- The DMMA ratings can be operationalized into ongoing measures, especially for activities where change is desired.
- If the assessment model is used for ongoing measurement, its criteria not only guide the organization to higher levels of maturity, they also keep organizational attention on improvement efforts.
- New projects must be influenced to adopt better practices.
- The roadmap should contain:
 - Sequenced activities to effect improvements in specific data management functions.
 - A timeline for implementing improvement activities.
 - Expected improvements in DMMA ratings once activities have been implemented.
 - Oversight activities.
- The roadmap will give targets and a pace for change within prioritized work streams, and accompanied by an approach for measuring progress.

3.5 Re-Assess Maturity

- Re-assessments should be conducted at regular intervals.
- They are part of the improvement cycle:
 - Establish a baseline rating through the first assessment
 - Define re-assessment parameters, including organizational scope
 - Repeat DMM assessment as necessary on a published schedule
 - Track trends relative to the initial baseline
 - Develop recommendations based on the re-assessment findings.
- Re-assessment can also re-invigorate or refocus effort.
- Changes to regulatory frameworks, internal or external policies, or technology are additional reasons to re-assess periodically.

4 Tools

- Data Management Maturity Framework
- Communication Plan
- Collaboration Tools
- Knowledge Management and Metadata Repositories

4.1 Data Management Maturity Framework

- The primary tool used in a maturity assessment.

4.2 Communication Plan

- Includes
 - an engagement model for stakeholders,
 - the type of information to be shared,
 - and the schedule for sharing information.

4.3 Collaboration Tools

- Collaboration tools allows for findings to be shared.
- Also, evidence of data management practices may be found in emails, completed templates and review documents.

4.4 Knowledge Management and Metadata Repositories

- These repositories may manage
 - data standards
 - policies
 - methods
 - agendas
 - meeting minutes or decisions
 - business and technical artifacts
- that serve as proof of practice.

5 Guidelines for a DMMA

5.1 Readiness Assessment/Risk Assessment

- It is helpful to identify potential risks and possible risk mitigations before undertaking a maturity assessment.

5.2 Organizational and Cultural Change

- Establishing or enhancing a Data Management program includes changes to processes, methods, and tools.
- With these changes, culture must also change.
- The DMMA results should be part of a larger discussion within an organization.
- When properly supported by effective data governance, DMMA results can result in a shared vision and accelerate an organization's progress.

6 Maturity Management Governance

- A DMMA is typically part of an overall set of data governance activities, each with its own lifecycle.
- The lifecycle of a DMMA consists of the initial planning and initial assessment, followed by recommendations, an action plan, and periodic re-evaluation.
- The lifecycle itself should be governed.

6.1 Metrics

- Metrics serve as both a core component of improvement strategies, and as key communication tools.
- Each organization should develop metrics tailored to its target state roadmap.
- Sample metrics could include:
 - **DMMA ratings**
 - **Resource utilization rates:** e.g. “Every resource in the organization spends 10% of their time manually aggregating data.”
 - **Risk exposure:** The ability to respond to risk scenarios. Can be expressed as the difference between the desired and current capability level.
 - **Spend management:** How is the cost of data management spread across the organization?
 - **Inputs to the DMMA:** Expresses the level of engagement throughout the organization.
 - **Rate of Change:** A baseline is established through the DMMA. Improvement trends are measured by periodic reassessment.

Sources

DAMA. Earley, S., & Henderson, D., Sebastian-Coleman, L (Eds.). The DAMA Guide to the Data Management Body of Knowledge (DAMA-DM BOK). Bradley Beach, NJ: Technics Publications, LLC. 2017.

Mainly chapter 15: Data Management Maturity Assessment