

Total quality management anna university Document

Total Quality Management Anna University: A Comprehensive Guide

Total Quality Management Anna University stands as a vital component of the institution's commitment to excellence in engineering education and research. As one of India's premier technical universities, Anna University emphasizes the integration of Total Quality Management (TQM) principles to enhance academic standards, streamline administrative processes, and foster a culture of continuous improvement. This article provides an in-depth overview of TQM at Anna University, exploring its objectives, implementation strategies, benefits, and impact on students, faculty, and the broader academic community.

Understanding Total Quality Management (TQM)

What is TQM?

Total Quality Management (TQM) is a comprehensive management approach focused on continuous improvement, customer satisfaction, and the involvement of all organizational members. It emphasizes the importance of quality in every aspect of an institution's operations, aiming to meet or exceed stakeholder expectations.

Principles of TQM

TQM is built upon several core principles, including:

- Customer Focus: Prioritizing the needs and expectations of students, faculty, and industry partners.
- Continuous Improvement: Regularly seeking ways to enhance processes and outcomes.
- Employee Involvement: Engaging all staff and students in quality initiatives.
- Process Approach: Managing activities as interconnected processes.
- Data-Driven Decision Making: Basing decisions on accurate data and analysis.
- Leadership Commitment: Strong support from top management to foster a quality culture.

Implementation of TQM at Anna University

Strategic Framework

Anna University has adopted a strategic framework that integrates TQM principles into its core operations:

- Establishing Quality Policies aligned with institutional goals.
- Developing Quality Objectives for departments and faculties.
- Implementing Quality Circles and Committees for continuous monitoring.
- Encouraging faculty and student participation in quality initiatives.
- Leveraging technology for quality enhancement.

Key Initiatives and Programs

The university has launched several initiatives to embed TQM in its processes:

- Academic Excellence Programs: Curriculum updates aligned with industry standards, outcome-based education, and competency development.
- Research and Innovation: Promoting research quality through peer review, publication standards, and collaborative projects.
- Faculty Development: Regular training in quality management, pedagogical skills, and leadership.
- Student-Centric Approaches: Improving student services, feedback mechanisms, and extracurricular activities.
- Quality Assurance Units: Establishing internal bodies like IQAC (Internal Quality Assurance Cell) to oversee quality policies and procedures.

Benefits of TQM at Anna University

Enhancement of Academic Standards

By implementing TQM, Anna University ensures:

- Up-to-date curricula aligned with industry needs.
- Improved teaching methodologies.
- Higher research output and quality publications.
- Better accreditation scores and rankings.

Improved Administrative Efficiency

TQM streamlines administrative processes through:

- Standardized procedures.
- Reduced redundancies.
- Enhanced transparency and accountability.
- Better resource management.

Student Satisfaction and Success

A focus on quality translates into:

- Better academic support services.
- Improved campus facilities.
- Strong industry linkage for internships and placements.
- Holistic development of students.

Faculty Development and Motivation

TQM fosters a culture of continuous learning for faculty, encouraging:

- Professional growth.
- Innovation in teaching.
- Collaborative research efforts.
- Recognition and reward systems.

Impact of TQM on Anna University's Reputation

Accreditation and Rankings

The commitment to TQM has significantly contributed to:

- Higher NAAC accreditation grades.
- Improved NIRF rankings.
- Recognition as a quality-focused institution nationally and internationally.

Industry Collaboration and Placement

Quality management practices have enhanced:

- Industry partnerships.
- Curriculum relevance.
- Student employability and placement records.

Research and Development

TQM encourages:

- High-quality research projects.
- International collaborations.
- Patents and innovations.

Challenges in Implementing TQM at Anna University

Despite its numerous benefits, the implementation of TQM faces certain challenges:

- Resistance to change among staff and faculty.
- Resource constraints.
- Maintaining consistency across departments.
- Ensuring continuous engagement and motivation.

To overcome these, Anna University employs strategies such as ongoing training, leadership support, and fostering a participative culture.

Future Directions and Continuous Improvement

Anna University envisions expanding its TQM initiatives through:

- Adoption of Industry 4.0 technologies (IoT, AI, Big Data) for quality enhancement.
- Strengthening feedback systems for students and industry partners.
- Enhancing sustainability practices.
- Promoting global collaborations for quality benchmarking.

The university remains committed to a culture of continuous improvement, aligning with global standards and emerging educational trends.

Conclusion

In summary, **total quality management Anna University** plays a pivotal role in shaping the institution's pursuit of excellence. Through strategic implementation, ongoing initiatives, and a culture of continuous improvement, Anna University has established itself as a leader in technical education. The integration of TQM principles ensures that the university not only delivers high-quality education but also evolves dynamically to meet the changing demands of industry and society. Embracing TQM is essential for sustaining academic excellence, fostering innovation, and maintaining global competitiveness in the ever-evolving landscape of higher education.

Keywords: Total Quality Management, Anna University, TQM in education, quality assurance, academic excellence, continuous improvement, university rankings, research quality, student satisfaction

Total Quality Management Anna University: A Comprehensive Analysis

Introduction

Total Quality Management (TQM) has become an essential framework for higher education institutions aiming to enhance academic excellence, administrative efficiency, and stakeholder satisfaction. Anna University, a premier technical university located in Tamil Nadu, India, has embraced TQM principles to elevate its academic standards and operational processes. This detailed review explores how Anna University integrates TQM into its functioning, the strategies employed, benefits realized, challenges faced, and future prospects.

Understanding Total Quality Management (TQM) in the Context of Anna University

What is TQM?

Total Quality Management is a holistic approach that seeks continuous improvement in organizational processes, products, and services through the active involvement of all members. It emphasizes customer satisfaction, process optimization, and a culture of quality.

TQM in Higher Education

While initially prominent in manufacturing, TQM principles have found significant relevance in academia by striving for:

- Enhanced teaching and research quality
- Improved administrative processes
- Greater stakeholder engagement (students, faculty, industry, and society)

- Institutional excellence and global competitiveness

Anna University's Adoption of TQM

Anna University has adopted TQM frameworks to transform its educational environment. The university aims to foster a culture where quality is embedded in every aspect of operation, from curriculum design to student services.

Core Principles of TQM at Anna University

Anna University's TQM initiatives revolve around core principles, including:

- Customer Focus: Prioritizing student satisfaction, industry needs, and societal expectations.
- Leadership Commitment: Top management's active role in setting quality standards and fostering a quality-centric culture.
- Involvement of All Members: Engaging faculty, staff, students, and alumni in quality enhancement activities.
- Process Approach: Streamlining academic and administrative processes for efficiency.
- Continuous Improvement (Kaizen): Regularly updating curricula, research practices, and administrative procedures.
- Fact-Based Decision Making: Utilizing data and feedback for informed decisions.
- Supplier (Stakeholder) Relationship Management: Collaborating with industry, government, and academia for mutual growth.

Implementation Strategies of TQM at Anna University

Anna University employs a multi-faceted approach to embed TQM into its operational fabric:

1. Quality Policy Formulation

- Clear articulation of quality objectives aligned with national and international standards.
- Commitment to excellence in teaching, research, and community service.

2. Curriculum Development and Review

- Regular updating of syllabi to incorporate emerging technologies and industry trends.
- Incorporation of outcome-based education (OBE) to enhance employability.
- Industry-academia collaborations for practical exposure.

3. Faculty Development Programs

- Training workshops on quality standards, pedagogical methods, and research methodologies.
- Encouragement of faculty participation in national and international conferences.

4. Student-Centric Initiatives

- Feedback mechanisms for continuous curriculum and teaching improvements.
- Skill development programs, internships, and industry visits.
- Student grievance redressal systems aligned with TQM principles.

5. Quality Assurance Cells and Committees

- Establishment of dedicated bodies like Internal Quality Assurance Cells (IQAC).
- Regular audits and evaluations to identify gaps and areas for improvement.

6. Accreditation and Benchmarking

- Pursuit of accreditation from bodies like NAAC, NBA, and ISO standards.
- Benchmarking against national and global best practices.

7. Research and Innovation Promotion

- Encouragement of interdisciplinary research projects.
- Support for patent filing, publications, and industry collaborations.

8. Infrastructure and Administrative Excellence

- Upgrading laboratories, libraries, and e-learning resources.
- Streamlining administrative workflows through ERP systems.

Impact of TQM on Anna University's Academic Ecosystem

Implementing TQM has yielded tangible benefits across various dimensions:

Academic Excellence and Research Output

- Increased number of publications in reputed journals.
- Higher research funding and collaborations.
- Improved student academic performance due to better teaching methodologies.

Enhanced Stakeholder Satisfaction

- Positive feedback from students regarding curriculum relevance and support services.
- Strong industry linkages leading to better placement records.
- Alumni networks contributing to institutional development.

Accreditation and Recognition

- Achieving high NAAC grades (e.g., Grade A+ or equivalent).
- NBA accreditation for various programs, indicating program-specific quality.

Operational Efficiency

- Reduced redundancy and delays in administrative processes.
- Effective resource utilization.

Global Competitiveness

- Increased international student intake.
- Recognition in global rankings for technical education.

Challenges Faced in TQM Implementation at Anna University

While the university has made significant strides, certain challenges persist:

- Resistance to Change: Some faculty and administrative staff exhibit reluctance towards new quality protocols.
- Resource Constraints: Upgrading infrastructure and faculty training require substantial investments.

- Sustaining Momentum: Maintaining continuous improvement initiatives over the long term demands persistent effort.
- Balancing Academia and Industry Needs: Ensuring curricula remain relevant without compromising academic rigor.
- Measurement Difficulties: Quantifying quality improvements in a comprehensive manner can be complex.

Case Studies and Best Practices

Case Study 1: Curriculum Overhaul Using TQM Principles

- In 2018, Anna University revamped its core engineering courses by establishing industry advisory panels, integrating feedback loops, and implementing outcome-based education.
- The result was improved student employability and higher employer satisfaction scores.

Case Study 2: Implementation of Quality Circles

- Faculty and student groups formed quality circles to identify and resolve issues related to campus facilities, academic delivery, and administrative services.
- These circles fostered a participative culture and led to tangible improvements.

Best Practice Highlight: Student Feedback Integration

- Systematic collection and analysis of student feedback to continuously refine teaching methodologies and course content.
- This approach has significantly enhanced teaching quality and student engagement.

Future Directions and Recommendations

To sustain and further enhance TQM initiatives, Anna University should consider:

- Embracing Digital Transformation: Leverage AI, data analytics, and e-learning platforms for quality monitoring.
- Strengthening Industry-Academia Interface: Establish more collaborations for research, internships, and curriculum guidance.
- Fostering a Culture of Innovation: Encourage experimentation, entrepreneurship, and creative problem-solving.

- Expanding Accreditation Efforts: Pursue international accreditations and certifications.
- Capacity Building: Continuous faculty and staff training on emerging quality standards and practices.
- Stakeholder Engagement: Regular forums with students, alumni, industry partners, and policymakers to align quality objectives.

Conclusion

Total Quality Management Anna University exemplifies a strategic approach to achieving academic and operational excellence. Through its comprehensive adoption of TQM principles focused on continuous improvement, stakeholder satisfaction, and process optimization, the university has made remarkable progress in elevating its standards. While challenges remain, ongoing commitment, innovative practices, and stakeholder collaboration position Anna University as a leading institution committed to quality in higher education.

By embedding TQM into its organizational culture, Anna University not only enhances its reputation but also contributes significantly to the development of skilled, innovative, and socially responsible professionals. Its journey underscores the importance of systematic quality management in shaping the future of technical education in India and beyond.

Question What is the focus of Total Quality Management (TQM) at Anna University? TQM at Anna University emphasizes continuous improvement, customer satisfaction, and process optimization to enhance educational quality and research output. How does Anna University implement TQM principles in its academic programs? The university integrates TQM by adopting quality standards in curriculum design, faculty development, student feedback, and accreditation processes to ensure high academic standards. What are the benefits of adopting TQM in Anna University's administrative processes? Implementing TQM leads to improved efficiency, reduced errors, better resource management, and enhanced overall institutional effectiveness. Are there specific certifications or recognitions Anna University has achieved through TQM? Yes, Anna University has received various quality awards and certifications such as ISO 9001, reflecting its commitment to TQM principles. How does TQM influence research and development activities at Anna University? TQM promotes a culture of excellence and continuous improvement in research projects, leading to higher quality publications and innovative outcomes. What role do students play in the TQM initiatives at Anna University? Students contribute through feedback mechanisms, quality circles, and participatory decision-making, fostering a quality-focused educational environment. How is TQM integrated into Anna University's faculty development programs? Faculty development programs include training on quality standards, best practices, and continuous improvement strategies aligned with TQM principles. What challenges does Anna University face in implementing TQM? Challenges include resistance to change, resource constraints, and maintaining consistent quality standards across diverse departments. Where can I find more information about TQM initiatives at Anna University? More details are available on the official Anna University

website, departmental publications, and reports on quality assurance and accreditation.

Related keywords: Total Quality Management, Anna University, TQM, Quality Assurance, Continuous Improvement, Academic Excellence, Quality Standards, University Accreditation, Process Optimization, Educational Quality

TOTAL RECORDS

Understanding Total Records: A Comprehensive Guide

Total records is a fundamental concept in data management, database administration, and information systems. Whether you're working with customer databases, sales records, or any large data repository, understanding what total records represent and how to efficiently manage them is crucial for data accuracy, reporting, and decision-making. This article explores the concept of total records in depth, covering its definition, significance, methods of calculation, and best practices for managing large datasets.

What Are Total Records?

Definition of Total Records

In the context of databases and data management, **total records** refer to the complete count of individual entries or data points stored within a dataset, table, or database. Each record typically corresponds to a unique entity, such as a customer, transaction, product, or event, depending on the nature of the dataset.

Differentiating Total Records from Other Data Metrics

- **Rows vs. Records:** In relational databases, each row often represents a record, but the term "record" emphasizes the logical data entity.
- **Fields vs. Data Points:** Fields are the individual attributes within a record, such as name or date.
- **Total Records vs. Total Data Size:** The total number of records is about count, whereas data size refers to the storage space consumed.

The Importance of Knowing Total Records

Why is Total Records Count Essential?

Understanding the total number of records in a dataset offers several benefits:

- **Data Accuracy and Integrity:** Ensures that datasets are complete and no entries are missing.
- **Performance Optimization:** Knowing the size of data helps in query optimization and system performance tuning.
- **Reporting and Analysis:** Accurate total records count is vital for generating reliable reports, summaries, and insights.
- **Resource Planning:** Helps in capacity planning for storage, processing power, and backup strategies.
- **Compliance and Auditing:** Ensures adherence to data management regulations and audit requirements.

How to Calculate Total Records

Methods for Counting Total Records

The approach to calculating total records depends on the database system or data storage method used:

- **SQL Databases:** Use the COUNT() function in SQL queries.
- **NoSQL Databases:** Utilize specific commands or APIs to retrieve document counts, such as MongoDB's countDocuments().
- **CSV or Flat Files:** Count the number of lines or entries programmatically via scripts or text editors.
- **Data Management Tools:** Use built-in functions within data management software like Excel, Tableau, or Power BI.

Example: Counting Total Records in SQL

```
SELECT COUNT() FROM customers;
```

This query returns the total number of entries in the "customers" table, providing a quick and accurate record count.

Factors Affecting Total Records Count

Data Filtering and Segmentation

Sometimes, total records are calculated based on specific criteria or filters, which can lead to

different counts:

- Active vs. inactive records
- Date ranges (e.g., records created in the last year)
- Geographical segmentation
- Data completeness (excluding records with missing fields)

Data Deduplication and Validation

Duplicate entries can inflate total records counts. Proper deduplication ensures an accurate count, especially in large datasets where duplicates are common.

Managing Large Numbers of Records Effectively

Strategies for Handling Big Datasets

- **Indexing:** Create indexes on frequently queried fields to speed up counting and retrieval.
- **Partitioning:** Divide large datasets into smaller, manageable segments based on criteria like date or region.
- **Archiving:** Transfer historical or less frequently accessed data to archive storage to optimize performance.
- **Use of Data Warehouses:** For analytical purposes, consolidate data into data warehouses optimized for large-scale queries.

Automation and Monitoring

Automate regular total records checks using scripts or scheduled database jobs. Monitoring helps detect anomalies like unexpected drops or increases in record counts, indicating potential data issues.

Applications of Total Records in Business and Technology

Data Analytics and Business Intelligence

Total records form the backbone of analytical processes. Accurate counts enable businesses to:

- Assess customer base size
- Measure transaction volumes

- Track growth over time

Database Performance and Optimization

Knowing total records helps in designing indexes, optimizing queries, and planning hardware resources to ensure fast data retrieval and processing.

Compliance and Regulatory Reporting

Regulatory standards often require reporting on data volume, especially in sectors like finance, healthcare, and government institutions.

Challenges Related to Total Records Management

Data Growth and Scalability

As datasets grow exponentially, maintaining accurate total record counts becomes more complex. Scalability solutions such as distributed databases and cloud storage are essential.

Data Quality and Consistency

Ensuring the integrity of total records involves regular cleaning, validation, and deduplication efforts to prevent inaccuracies.

Real-Time Data Tracking

In fast-paced environments, real-time updates to total records are necessary for accurate decision-making. Implementing real-time data pipelines helps keep counts current.

Conclusion

Total records is a key metric across various data-driven disciplines. From understanding the size of your datasets to optimizing system performance and ensuring data integrity, managing total record counts is vital for effective data management. With the right tools, strategies, and best practices, organizations can handle large datasets efficiently, ensuring accurate reporting, compliance, and insightful analysis. Whether you're a database administrator, data analyst, or business leader, mastering the concept of total records will enhance your ability to leverage data for strategic advantage.

Understanding Total Records: A Comprehensive Guide

In today's data-driven world, understanding the concept of total records is essential for professionals across various fields—from database administrators and data analysts to marketers and project managers. The term total records typically refers to the complete count of individual data entries stored within a database, dataset, or system. Whether you're managing customer data, tracking sales, or conducting research, grasping what total records mean, how to calculate them, and why they matter can significantly influence decision-making and operational efficiency.

In this comprehensive guide, we will explore the concept of total records in depth, covering its definition, significance, methods of measurement, common challenges, and best practices for managing large datasets.

What Are Total Records?

Total records denote the total number of individual data entries within a specific dataset or database. Each record generally represents a single entity or unit of information, such as a customer profile, transaction, product listing, or survey response.

Key Characteristics of Total Records:

- Completeness Indicator: Total records give a snapshot of how much data is available.
- Size Metric: It helps assess the size of a dataset, which is crucial for storage planning and performance tuning.
- Data Quality Indicator: The number of total records can sometimes reflect the scope of data collection efforts.

Examples of Total Records:

- A customer database containing 10,000 customer profiles.
- An e-commerce platform with 250,000 transaction records.
- A research dataset with 15,000 survey responses.

Why Is Total Records Important?

Understanding the total number of records within a dataset is more than just a numerical count—it influences many aspects of data management and analysis.

Significance in Business and Data Analysis

- Data Volume Assessment: Knowing total records helps organizations gauge the scale of their data assets.
- Performance Optimization: Large datasets require optimized queries, indexing, and storage solutions to ensure efficient processing.
- Resource Planning: Storage, processing power, and backup strategies depend on understanding total data size.
- Data Quality and Completeness: Comparing total records against expected figures can reveal gaps or inconsistencies.
- Reporting and Compliance: Accurate record counts are essential for reporting standards, audits, and regulatory compliance.

Impact on Decision-Making

A clear understanding of total records supports strategic decisions, such as targeting marketing campaigns, expanding data collection efforts, or archiving old data.

How to Measure Total Records

Calculating total records is a fundamental task in data management. The method varies depending on the database system, data format, or platform used.

Methods by Data Storage Type

- Relational Databases (SQL)

- Simple COUNT Query:

```
```sql
```

```
SELECT COUNT() FROM table_name;
```

```
```
```

This query returns the total number of records in a specific table.

- Estimated Counts (for large datasets):

Some databases support system functions for faster approximate counts:

```
```sql
```

```
SELECT reltuples AS estimate FROM pg_class WHERE relname='table_name'; -- PostgreSQL
```

```
```
```

- NoSQL Databases

- MongoDB:

```
```javascript
```

```
db.collection.countDocuments();
```

```
```
```

- Cassandra:

Counting total records can be resource-intensive; often, data is estimated via counters or sampling.

- Flat Files and Spreadsheets

- For CSV, Excel, or text files, total records can be counted by:
 - Counting the number of lines (excluding headers).
 - Using built-in functions in spreadsheet software (e.g., `COUNTA()` in Excel).

Automated Tools and Scripts

- ETL Tools: Many extract-transform-load (ETL) tools automatically provide record counts during data ingestion.
- Custom Scripts: Python, R, or other scripting languages can be used to count records programmatically.

Common Challenges in Counting Total Records

While the concept seems straightforward, practical challenges can complicate accurate record counting.

- Large Datasets

Counting records in massive datasets (millions or billions of entries) can be resource-intensive and time-consuming. Approximate counts or sampling methods are often employed.

- Data Duplication and Redundancy

Duplicate records inflate total counts, potentially misleading analysis. Deduplication processes are necessary for accurate counts.

- Inconsistent Data Structures

Data stored across multiple systems or formats may require consolidation before accurate total record counts can be obtained.

- Data Archiving and Historical Data

Archived data or historical records may be stored separately, making it challenging to determine an overall total across systems.

Best Practices for Managing Total Records

Effective management of total records ensures data integrity, efficiency, and actionable insights.

- Regular Data Audits

Conduct routine audits to verify the accuracy of total record counts. This includes checking for duplicates, missing data, and inconsistencies.

- Implement Data Governance Policies

Establish standards for data entry, storage, and maintenance to ensure record counts remain

accurate and meaningful.

- Use Indexing and Partitioning

Optimize database performance by indexing key fields and partitioning large tables to facilitate faster counts and queries.

- Leverage Metadata and Data Catalogs

Maintain documentation about data sources, update frequencies, and total record counts to support transparency and data governance.

- Automate Count Processes

Set up scheduled scripts or tools to automatically update total record counts, especially after data loads or updates.

Analyzing Total Records: Beyond the Count

While knowing the total number of records is vital, deeper analysis can reveal more about data quality and insights.

- Record Completeness

Assess the percentage of records with complete data fields to identify gaps.

- Growth Trends

Track how total records change over time to understand data accumulation rates or identify anomalies.

- Segmentation

Break down total records into categories or segments for targeted analysis, such as active vs. inactive users.

Case Studies: The Power of Understanding Total Records

Case Study 1: E-Commerce Platform

An online retailer notices their total transaction records increased from 500,000 to 1 million over six months. This growth prompted the company to review storage capacity, optimize database queries, and analyze purchasing patterns more effectively.

Case Study 2: Healthcare Data Management

A hospital system manages patient records totaling over 2 million entries. Regular counts help ensure compliance with data retention policies, and identifying duplicate records has improved patient care accuracy.

Conclusion

The concept of total records is fundamental to effective data management, analysis, and decision-making. Whether dealing with small spreadsheets or massive distributed databases, understanding how to accurately measure, interpret, and leverage total record counts empowers organizations to optimize their data assets. By implementing best practices, addressing common challenges, and integrating count metrics into broader data governance frameworks, professionals can maximize the value derived from their datasets.

Remember, behind every number lies an opportunity to uncover insights, improve operations, and make informed decisions. Mastering the understanding of total records is a crucial step toward data excellence.

Question What does 'total records' refer to in a database context? In a database context, 'total records' refers to the total number of entries or rows stored within a particular table or dataset. **Answer** How can I efficiently retrieve the total number of records in a large database? You can use the SQL COUNT() function to efficiently retrieve the total number of records, for example: SELECT COUNT() FROM table_name; Why is knowing the total records important for data analysis? Knowing the total records helps in understanding the dataset size, planning processing resources, and assessing the scope of analysis or reporting tasks. What are common challenges when dealing with total records in big data systems? Challenges include slow query performance, high resource consumption, and difficulty maintaining real-time counts in distributed or sharded databases. Can total records be dynamically updated in real-time applications? Yes, with proper database design and indexing, total record counts can be updated dynamically, often through triggers or real-time counters integrated into the application. How does data duplication affect total records count? Data duplication can inflate the total records count unless duplicates are identified and removed, which is essential for accurate data analysis. What is the difference between total records and filtered records? Total

records refer to the complete count of entries in a dataset, whereas filtered records are those that meet specific criteria or conditions within the dataset. Are there any best practices for managing total records in a large-scale system? Best practices include indexing for faster counts, maintaining summary tables for quick access, and regularly archiving or partitioning data to optimize performance. How does the concept of total records apply to cloud-based data storage solutions? In cloud storage, total records help monitor storage usage, optimize query performance, and manage scaling strategies across distributed environments.

Related keywords: total entries, data count, record total, dataset size, total data points, record quantity, overall entries, total data records, data volume, record tally

Read the full article online: [TOTAL RECORDS](#)