

*MS Access, MS Excel, similarity, differences, data,
managing, fit choice, compression*

Ali Fattah DAKHIL^{}, Weffa Muhammed ALI^{**},
Ali Atshan Abdul REDA^{***}*

PRIORITIZING SOFTWARE CAPABILITIES AND FOCAL POINTS OF MS ACCESS AND EXCEL IN PERSPECTIVE OF DATA MANAGEMENT

Abstract

Microsoft Corporation products have overwhelmed almost all organizations around the world even beside other operating systems like UNIX, Ubuntu and others. MS Office software products in particular, have being used widely in big portion of our work and business. In specific, MS Access and Excel are very famous and so usable software in between other Microsoft office products. Many similarities are shared between Access and Excel, meanwhile, many key differences are worth to point them out, too. Mainly, this research spotlights on primarily motivated topic of how they can manage data as they have been designed for. The mission of this research is to show how to employ MS Access and Excel in the right way in business work after indicating strength and weaknesses of both of them. Thus, we need to fulfill the right and suitable enough choice between Access and Excel that meets our business work requirements. A detailed list of significant features and key points are discussed and compared of both software leads to conducted proper software use.

^{*} University of Sumer, Faculty of Computer Science and Information Technology,
Computer Science Dept., Thi-Qar, Iraq, allee.fattah@gmail.com

^{**} University of Thi-Qar, Educational Collage of Pure Science, Computer Science Dept.,
Thi-Qar, Iraq, wafaam20142015@gmail.com

^{***} University of Sumer, Faculty of Computer Science and Information Technology,
Computer Science Dept., Thi-Qar, Iraq, aliatschan_1969@yahoo.com

1. INTRODUCTION

Microsoft Access and Microsoft Excel have numerous likenesses and differences, which can make it hard to choose which program that we should use to satisfy our needs in business work in perspective of data management. For example, both software can do intensive operations and can store big data. There are many real life scenarios have failed to use such programs in the right way. Case studies showed that some organizations have transformed from Excel to Access and vice versa. Normally, these two software were designed to implement a particular job. It has to be said, it is a fallacy that both program can deliver exactly same work with little distinctions. Microsoft has built these two big achievements in order to each one can perform entirely different missions. Therefore, there are couple of points this paper adopts to juxtapose these programs. This search is not to compare between Access and Excel in a manner shows which good or not. This study has a strategy of adopting several keys of interesting in perspective of data management not in perspective of software specifications and how technical issued can be handled. Data manipulation with these programs focuses on data analyzing, data security, data capacity, and data accessibility. Each topics has several sub-topics by which one program would have priority and more applicable at those features than other. For instance, Excel does mathematical operations with high potency than Access, Schmalz (2005). In addition, there are many details under these sub-topics are also precisely discussed among both software. After that, we prepare a collection of best situations and scenarios that these software can do. Finally, a good recommendation of using such programs with concluded an advice in which this paper can deliver the actual goal.

2. CASE STUDY

In many cases, business solutions are managed by MS Excel when MS Access is more proper and fits such requirements. Or on the other hand, maybe Excel was initially a smart thought, yet the information has outgrown an Excel arrangement and the time has come to utilize a database program. Luckily, we can see in some business data works and projects move from Excel to Access. One example, a non-profit organization called Cancer Lifeline based in Seattle, Microsoft (“Customer case study: Moving from Excel to Access”, 2008), basically, it designed its grant tracking business with Excel. With the time, data redundancy has run into big difficulty. So, they deiced to transfer to Access.

A recent research by A. Hameed Yassir and A. Fatah Dakhil (2016) has shown improper use of Excel and Access by Thi-Qar province offices. Figure 1 shows the real percentage use of both Access and Excel. This research has been cross many offices, around 45 ones. Regards to its result by survey forms, many offices misuse Access and Excel. The total results have shown that 90% of works are

managed by Excel. On the other hand, 30% of works are managed by Access. However, these information refer for the actual usage of them does not mean the correct choice. After analyzing such information, we found that 40% out of Excel percentage are fit to use and the left portion were supposed to be managed by either Access or other software. Meanwhile, Access reached 95% out of its percentage of use. That means Access was employed properly rather than Excel.

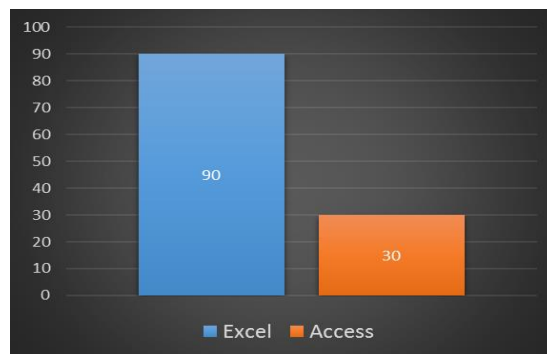


Fig. 1. Percentage use of Access and Excel in city of Thi-Qar offices

3. PROGRAMS BENEFITS AND COMPRESSION

In order to achieve a significant accuracy and performance on data manipulation, it is very critical for choosing the proper software among them regarding to their potency upon key point of what and how they manage data, Alexander (2007).

3.1. Data Analysis and Information Retrieving

Under this perspective view of point, there are three main topics to discuss:

- Data Modeling: What-if analysis tool is very useful to prognostic a worksheet's model result. This tool allows us to find worst case scenarios and best case scenarios with comparative results in concise report. This feature is only supported in *Excel*.
- Information Querying: Access would be best choice in term we aim to view information (extracted data) in diversity ways based on interchangeable events and conditions. As SQL supplied with Access, so it is highly supported to manage data with SQL's ability to retrieve data from different tables, using expressions, calculated fields ... etc. Thus, *Access* is better to go with this option.
- Charts and PivotTable: Even both software provide these tools, however, Excel has advanced charting features and supreme PivotTable. *Excel* has priority here for these features.

Below is a brief description for all previous features.

Tab. 1. Data Analysis and Information Retrieving Compression

Data Analysis and Information Retrieving	
Features	Software
Data Modeling	Excel
Information Querying	Access
Charts and PivotTable	Excel

3.2. Security

Generally, both program have same similarity of security capabilities as password and data encryption techniques. However, there are some variations in concept of how user-level preservation works Microsoft (“Protection and security in Excel”, 2016) and Help4Access (“MS Access Security”, 2016). Therefore, couple of points are mentioned here:

- Data Restriction: with Excel, user-based permissions can be applied to reach information or simply by perform read-only privileges which forbid others from accessing such data. However, user-level protection feature is not supported with Access, but Access does provide a model of user security of any database server.
- File-level Security: Encryption can be applied by both program. Also, we would also ask for password to reveal encrypted data. In addition, digital signature is used to secure database file or workbook.
- User-level Security: In Excel, crucial data are private or hidden by hiding rows and columns. Also, protecting all worksheet to manage user control over hidden data. Locking and unlocking cells in Excel to prevent unintentional modification.
- Data Loss Policy: Access provides wonderful features to backup database in a schedule that fulfills our needs. In addition, database recovering is allowed to restore entire database or even some object such as tables. Meanwhile, in Excel, we can use AutoRecover data while we modifying data. Table 2 shows these features in compression view.

Tab. 2. Security Features Compression

Security	
Features	Software
Data Restriction	Both, with efficient of Access
File-level Security	Both
User-level Security	Excel
Data Loss Policy	Both ¹ , with efficient of Access

3.3. Data Saving and Storage

There are some key points about amount of data and how to save them in both software, Walkenbach (2015) and Alexander & Kusleika (2016).

- Data flexibility and integrity: Data integrity is preserved by unique identifiers, and this is to vouch that all records or rows are distinct. This is important for search and sort operation on our data. Access, utilizes this feature by applying AutoNumber data type. No “orphan” records would be exist when Access ensures data integrity, so that any new records have a corresponding record and other related table. Excel allows us to manipulate data in a free-form method, however, Excel does not deal with relationship model data, so it does not support referential integrity. Excel can apply Data Validation to manage entry of data.
- Relational and Flat Data: Worksheet or single table is called nonreltional or flat data. Excel is the better choice when we want to create a list of students’ names with solely one address. On the other hand, Access fits the requirement of store students’ list that have many addresses for each one.
- External and Local Data: Both software have commands to communicate with diverse of external data sources without importing it. Table 3 illustrates these features all together.

Tab. 3. Data Saving and Storage Compression

Data Saving and Storage	
Features	Software
Data flexibility and integrity	Both, with efficient of Access
Relational and Flat Data	Access
External and Local Data	Both

3.4. Users-Cooperation

Excel and Access have potency to work in collaborative soundings, for example, file sharing, network and SharePoint Services. Even though, there are some remarkable points in the manner that data would be accessed and managed, Alexander (2010).

- Multi-user Cooperation: In Excel, collaboration functionality is best when users access data that a workbook at various times instead of at the same time, so it only allow for share workbook. In Access, users can use a single database simultaneously as Access lock solely records that under editing.

- SharePoint Services: Excel supplies just a single method to work together with various users on a SharePoint Services site. We could transfer a workbook to Windows SharePoint Services archive libraries, where singular users can look at the workbook to roll out improvements, keeping different users from changing the workbook in the meantime. Users can alter a workbook without looking at it of the document library, in which case they should arrange with different users to stay away from information clashes.
- Windows Shared Folder: In case users access database in shared folder, simultaneously they can open and use such file. However, a particular records are locked when it is under editing by other users. Table 4 has all of them in compression view.

Tab. 4. Users-Cooperation Compression

Users-Cooperation	
Features	Software
Multi-user Cooperation	Excel
SharePoint Services	Excel
Windows Shared Folder	Both

4. FEATURES COMPARISON BETWEEN EXCEL AND ACCESS

After traversing among many key points of features, it is time to put together all their capabilities in such arbitrage and compare them individually. In fact, these tables below shows how each feature should be highlighted according its possibility to apply. Legend: ● = Recommended (Full), ◐ = Acceptable (Partial), ○ = Doesn't Apply (None).

4.1. Data managing

This attribute has some keys of discussion as listed and compared in table 5.

After evaluating these attributes, and we give 1 for recommended (full), 0.5 for acceptable (partial) and 0 for does not apply (none). We got a result like: Access = 8 and Excel = 4.5. Thus, managing data in Access has higher grade than Excel.

Tab. 5. Data managing comparison of MS Excel and Access

Feature	Access	Excel	Comments
Storage quantity	●	●	Both Excel and Access can have millions of records.
Data types diversity	●	●	Both well support with numbers, text, dates, and others data types.
Validation and verification	●	◐	Both programs allow to control data. Access offers to us more flexibility and control, like determining data input masking.
Security	●	●	Both programs manage access to our data by applying a diversity of security features, like signatures, passwords, encryption, data protection and digital.
Objects oriented and Rich text	●	○	Access characteristics with many facilities to work with large objects like images and documents as well as rich text.
Tables relationships corporation	●	○	Access allows creating several kinds of relationships between tables to ensure data integrity.
Data sharing	●	◐	In Access, users can work concurrently with same data and offers firm choices for changing like conflict and locking
Compile and amalgamate dissimilar data	●	◐	Access has feature of data gathering and collection

4.2. Data Importing and Exporting

This attribute focuses on data integration with external world and data source around these software. Table 6 shows these attributes with comparison.

Tab. 6. Data Exchange comparison of MS Excel and Access

Feature	Access	Excel	Comments
Data importing and exporting.	●	●	Several data resources would integrate with both programs for importing and exporting data, like database, XML, spreadsheet and text.
Editing, Querying and viewing external data.	●	◐	Access allows us for reach other data sources with linked tables and it would communicate easily with SQL server.
Web page deployment	●	●	Both programs can publish dynamic and static web pages. With Excel, interactive pages would be delivered by Excel facilities. With Access, conflict resolve applied by SharePoint
SharePoint lists influence	●	○	Access has effect on SharePoint list

Now, after grading these attributes with numeric values as previous, we would have Access 4 and Excel 2.5. That is to say Access has higher effectiveness on data deploying and exchanging.

4.3. Forms and Reporting

This attributes deals with the ability of creating forms and friendly interface that a developer can use or design. As there are couple of features, table 7 shows them in comparison manner.

Tab. 7. Using forms and reports in MS Excel and Access

Feature	Access	Excel	Comments
Converting and exporting to XPS and PDF	●	●	Both can do this
Reporting	●	●	Both programs can quickly generate reports for data summarization, sorting, filtering and grouping
Forms supporting	●	◐	With Access, we develop forms that could ease to manage, and manipulate our data.
Labeling mail to produce addresses	●	○	Access only has this option

In this attributes we also Access has scored over Excel. Access got 4 scores and Excel obtained 2.5 only. This result guides us for preferring Access instead of Excel.

4.4. Data querying

Querying data is to retrieve information that has been stored in software tables or sheets. Table 8 shows these attributes.

Tab. 8. Data querying in MS Excel and Access

Feature	Access	Excel	Comments
Data sorting and filtering	●	●	Both can do this
Querying complex demands and variety views	●	◐	Access has this option more than Excel

Access is more sufficient working with data querying because it is supported with SQL alongside with power data extraction tools. Also, here in the feature we can find Access reached 2 scores and Excel 1.5 scores.

4.5. Data visualization

Table 9 shows the main attributes of graphically showing data and information result.

Tab. 9. Data visualization in MS Excel and Access

Feature	Access	Excel	Comments
Graphics and SmartArt usage			Excel only has this option
Charts accessibility			Excel has this option over Access
Format data restrictively			Excel has this option over Access

In this attribute of visualize information with variety of tools, Excel has high score over Access in opposite of other attributes. Excel is 3, however Access is 1 only.

4.6. Data Calculation

Mathematics operations and numeric calculations are so required tasks in data management area. Table 10 shows list of some features under this topic.

Tab. 10. Data calculation in MS Excel and Access

Feature	Access	Excel	Comments
what-if analysis support			Excel only has this option
Functions and formulas			Excel has this option over Access
Use of PivotChart and PivotTable views			Excel has this option over Access
Operating Complicated math and calculated to derive desired information			When mainly need to run statistical and sophisticated works, such as data analysis, Excel is considerably is the choice to apply and execute such missions chiefly in terms data was numeric and so on

Again, Excel here has reached high score against Access. Back to numerical evaluation, we can have Excel with 4 scores, meanwhile Access got only 1.5 score.

5. EVALUATION RESULTS

So far, we went inside some attributes and features within those attributes. Conducted results would have been drawn here in data table and comparison. As we have given a numeric values in our evaluation processes, now we are going to map all of the in one place. Table 11 depicts this fact as following.

Tab. 11. Evaluation results in MS Excel and Access

Attributes	Access	Excel	Priority
Data managing	8	4.5	Access
Data Exchange	4	2.5	Access
Forms and Reporting	4	2.5	Access
Data querying	2	1.5	Access
Data visualization	1	3	Excel
Data Calculation	1.5	4	Excel
total	20.5	18	Access = 4 Excel = 2

In short words, we can see the evaluation and comparison results. This results proves that Access hits some major points in four criteria but Excel reached two significant categories.

6. BEST USE OF EXCEL TASKS

Excel program considered a spreadsheet program. Excel file is organized as workbooks that contains one or many worksheets. Excel is optimized for mathematic calculation and data analysis more than as serving database engine. This flexibility of Excel would create an analyzing data model, executing simple or complicated formulas to apply math calculations, pivoting information and many manners, and show data in professional looking. Below are some use of Excel, (Humphrey, 2010):

- In case there is a need to track an item in a list whatever for personal purpose or team use.
- Applying graphical emphasizing tools such as icons for conditional formats, bars and colors.
- Planning to build charts occasionally.
- Trying to use report in pivot table in order to explore hierarchal information and flexible view.
- Occasionally applying statistical comparison and analysis tasks on the data.

- Requiring to perform advanced applications math such as what-if operations on data, for example regression tasks, engineering... etc.
- Needs only flat view of table that is not relational tables which depend on multi tables related.
- When data is almost numeric.

6.1. Popular Scenarios Applied for Excel

- Tracking: Excel used to pursuit data in time worksheet. In example of this, tracking time work and inventory menus.
- Sailing and Billing: Excel is very useful for managing sales and billing like for purchase order, packing slips and sales invoices.
- Budgeting: Whatever purpose, business or personal depending Excel can create any type of budget. For example, budget for event, marketing plan and retirement.
- Usability of calendars: Excel has grid-like nature view. Because of this, Excel has good tools to offer calendar to track school activities for example or business events.
- Planning: Excel offers sophisticated tools to create plans for many future events.
- Reporting: As Excel does summering and statistics information, it also provides professional reports for several tasks.
- Financial and Accounting: Many rich calculations capabilities are embedded in excel as well as financial features such as income declaration, or cash flow declaration or profit and loss declaration.

7. BEST USE OF ACCESS TASKS

For occasionally using, is to record data and then export, reporting subset of that data and export. Appropriate forms are supply within Access than a worksheet as in Excel do work with data conveniently. Reports in Access allow us to epitomize information in GUI forms or printed hard paper based on frequently automate performed tasks. Access would comply data under predefined structure such as controlling data types that can be provided in software. Also, how data in table is related to another data in other tables. Thus, Access leads to ensure data validation and accuracy. We can simply say that Access tables are manipulated for complex query in corresponding to data in other relation even though Excel worksheet looks much as Access table. Below are some actions that Access fits to, MacDonald (2010):

- Foreseeing database works under several users’ access and we want to firm options sufficiently managing updates such as conflict results and record locking.
- Expecting for requiring more tables to nonrelational or flat originated data set.
- Need to accomplish compound queries.
- Demand to produce assortment of report or mailing tags.

7.1. Popular Scenarios Applied for Access

- Planning events: Access operates event locations, participate and dates and produce it out.
- Tracking order: Managing information about customers, orders, products and generating reports of employees’ sales, time period, region and other related topics.
- Contacts: Managing mailing addresses and contacts information and them in MS Word to issue envelopes, from letter or mailing tags.
- Saving and inventory tracking: Access is employed to store and retrieve track of daily work and enquiries

8. RECOMMENDATIONS AND ADVICE USAGE OF BOTH SOFTWARE

As it has been mentioned before that each software has its own strengths and weaknesses. So, it would be very useful to get advantages of both of their capabilities. In example of this, if we have an Excel worksheet to analyze and calculate data, with time it has become very big and complicated. Also, numerous of users try to access such data. In this situation, we then would to link or import this worksheet to an Access database instead of dealing with it within Excel. On the other side, perhaps we have data inside Access in order to create elaborated pivot table view reports and sophisticated Excel graphics charts. Actually, it doesn’t matter which program has been chosen first, as it easily can share and transfer data among each other, by which we can sustain our work. In fact, it is so handy to practice both software as we do not need to have a connection between them, only we can apply importing, exporting and copying. (Monk, Brady & Mendelsohn, 2017).

9. ACCESS AND EXCEL INTEGRATION

Based on the fact and need of using and employing both software in our enterprise also to have optimum solution, here we put some important reasons and situation that we should use both program same time under proper communications. Using Access with Excel is that best use of both of them. Now, let us list those key points in which we would have best practice of software.

9.1. All kind of user can use Access

Normal people can use easily use Access as it can gather data and query it in many handy ways. We can and use any different tables with particular join among them. Figure 2 illustrate this fact.

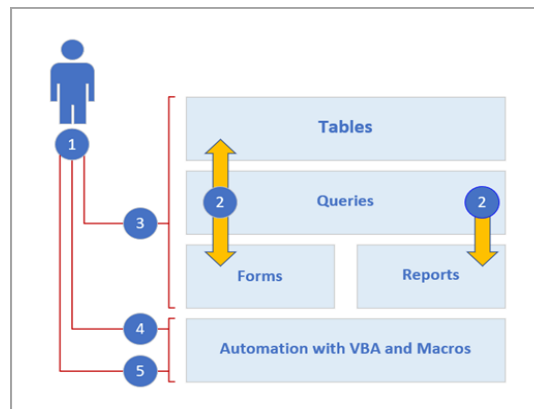


Fig. 2. MS Access Layer of Usage

So, we have five kinds of use about Access. First, in three ways we can use Access: as a developer, an occasional user, or a power user. Second, the core of a database application is made up of Tables, queries, forms, and reports objects. Third, occasional users can use Excel-like features, fluent user-interface and wizards. Fourth, power users can apply database design, expressions and macros. Fifth, developers would work VBA code to develop database applications.

9.2. Excel Sheets to Access Table

A decent method to begin is to copy information from Excel into Access. You can make an Access table and show it in datasheet, which intently looks like an Excel worksheet. You can do basic table creation tasks. When you copy information from Excel into Access, you don't have to make a table to start with, or open a table in datasheet panel. Access naturally inquires as to whether your information has headers, makes great conjectures at utilizing the right data type, and makes an Access table. It couldn't be less difficult.

9.3. Linking Excel worksheet with Access

One of the most straightforward approaches to derive the advantages of both Excel and Access is to link an Excel worksheet to an Access table. Utilize an Access link when you intend to keep the information in Excel, yet additionally frequently use a portion of the numerous Access features, for example, querying and reporting. You link data from Access, but not from Excel.

9.4. Importing Data from Excel to Access

In Access and Excel world, the word importing has two different meanings. In excel, when importing data, a live update still there between excel and data source. In Access, importing is one way method. So, after importing data into Access, it is being stored there permanently (Monk, Brady & Mendelsohn, 2017).

9.5. Import data to Excel from Access

In opposite of importing, this way of connecting is to transfer data to excel. In this manner, live update and data refreshing occur whenever data modified in Access.

10. CONCLUSION

After this concise journey of discussing and pointing out both software capabilities, this research has shown how to properly use Access and Excel and employing them with fit empirical business as they were designed to. Also, this paper has classified, in details, the variety of disciplines and categories of data management areas that these programs perform and deliver. Now, it is plain to guide ourselves when to use them in a way that in future, such work can be handled and no problems would emerge due to proper usage of such software. In brief, as we easily can conclude here, there are some tasks that only Excel can perform. Others, only Access can achieve. Some tasks can be done with both of them. Finally, the optimum use of both Access and Excel, is when we apply proper integration and communications between them. With both software integration, we can get advantage of their abilities without forfeiting one's specifications. Thus, there are four aspects that we have come with. First, Excel missions, the tasks which only Excel can deliver. Second, Access missions, the tasks which only Access can deliver. Third, Shared tasks, are the tasks that both of them can deliver. Forth, tasks are implemented within both software communications and exchange.

Acknowledgment

I would to thank all the resources which helped me to come up with this paper.

REFERENCES

- Hameed Yassir, A., & Fatah Dakhil, A. (2016). Information Technology Services in Thi-Qar Province Analysis Study. *Journal of Univesity of Thi-Qar*, 11(4), 1–10.
- Alexander, M. (2007). *Microsoft Access 2007 data analysis: Unleashing the analytical power of Access*. Indianapolis, IN: Wiley Technology Pub.
- Alexander, M., & Kusleika, D. (2016). *Access 2016 bible* (pp. 33–131). Indianapolis, IN: Wiley Technology Pub.
- Alexander, M. (2010). *The Excel analysts guide to Access* (p.345). Indianapolis, IN: Wiley Pub Technology Pub.
- MS Access Security*. (n.d.). Retrieved May 7, 2018, from <https://www.help4access.com/ms-access-security>
- Protection and security in Excel*. (n.d.). Retrieved March 8, 2018, from <https://support.office.com/en-us/article/protection-and-security-in-excel-be0b34db-8cb6-44dd-a673-0b3e3475ac2d>
- MacDonald, M. (2010). *Access 2010 the missing manual*. Sebastopol, CA: OReilly.
- Customer case study: Moving from Excel to Access*. (n.d.). Retrieved January 7, 2018, from <https://support.office.com/en-us/article/customer-case-study-moving-from-excel-to-access-9bc87c0c-4d94-488b-9629-b74b712840b8>
- Humphrey, M. L. (2010). *Microsoft Excel for beginners*. Eastlake, Oh.: Web Wise Seniors, Inc.
- Monk, E. F., Brady, J. A., & Mendelsohn, E. I. (2017). *Problem-solving cases in Microsoft Access and Excel*. Boston, MA: Cengage Learning.
- Schmalz, M. (2005). *Integrating Excel and Access*. Beijing, China: OReilly Media.
- Walkenbach, J. (2015). *Excel 2016 Bible* (pp. 109 - 170). USA: John Wiley & Sons, Inc..