

TME 2 - Research Portfolio

Athabasca University

Enterprise Information Management

COMP602 F15

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## Introduction

This document contains the COMP 602 Research Portfolio and provides evidence intended to satisfy the learning objectives for COMP 602 – Part 2 (see Table I.1). Just as in the Foundations Portfolio (Part 1), this paper is additionally meant to serve as a formal reflection of the course outcomes to-date. This Portfolio acts as a ‘reflection of reflections’ and allows for a further comprehension around how knowledge was gained as well as identifying gaps that remain. .

## Mapping Learning Outcomes

Table I.1 shows the learning outcomes for the portion of the course (Weeks 10 - 12). The ‘Analysis of Learning Outcomes’ section of this document will list each outcome and provide a commentary that outlines how success was achieved.

#	Course Outcome
1	Analyze business data needs and requirements for data-driven systems.
8	Argue the strengths and weaknesses of different approaches to data management.
9	Solve problems in technology, technique & process relating to database management & design.
10	Independently & reflectively research issues, technologies, processes & tools in IM.
11	Critically evaluate information and data technologies in the context of organizational needs.
12	Be a reflective practitioner in the information management field.

## Evidence Documents

Three documents provide the majority of the evidence for meeting the course outcomes. The documents are found at the links below. This paper will refer to sections or pages within the documents.

Research Article (PDF): <https://landing.athabascau.ca/pages/view/1327266/research-paper>

Research Presentation (PDF): <https://landing.athabascau.ca/pages/view/1348574/research-presentation>

Research Design (PDF): <https://landing.athabascau.ca/pages/view/1348522/research-design>

## Research Project Overview

The ultimate goal of my research study is to increase the organizations knowledge and improve customer (physician) satisfaction by leveraging docRM interaction data (both structured and unstructured). The study examines Data Analytics approaches, techniques, and tools deemed appropriate for the organization. Novel and leading edge designs will be incorporated in final recommendations. The docRM scenario includes four over-arching objectives. The first objective relates to traditional CRM capabilities and was fulfilled in COMP 602 – Part 1. The remaining three objectives are related to my research paper (part 2) on ‘Data Analytics’. The objectives, as stated in the research paper are:

- Streamline customer engagement - implement a CRM platform to support a central point of contact. The platform must be specific to physician needs and designed to capture support service interactions between staff and customers (i.e. physicians).
- Leverage docRM data - identify metrics, key performance indicators (KPI's), and explore data analytics (e.g. trending, prediction) to develop a better understanding of physician members and ultimately provide decision support.
- Integrate other sources of data - combine docRM metrics with other information system data to provide a holistic member view.
- Develop internal technical competency - develop analytics core competency within organization.

## Research Design

A formal Research Design document was completed and can be found in the Landing at (<https://landing.athabasca.ca/pages/view/1348522/research-design>). The research design document is meant to explicitly show how the indicative grading criteria for the research project were met (grading criteria found [here](#): Athabasca University, 2015b). The research design addresses the following areas.

- (1) Research Objectives – Discusses the link of research to scenario and outlines the logical document structure, chosen and logical flow. Each section builds upon the previous section.
- (2) Problem Statement and Research Questions – The problem statement is clearly stated and fully addressed in the research.

- (3) Research Methodology – Exhibits the use of well-designed research methodology and shows a clear match between the problem being addressed and the methods used.
- (4) Uniqueness and Novel of Research – identifies originality and attention to detail in the research.
- (5) Validity and Limitations – shows critical awareness of potential research flaws.
- (6) Research Management – discusses tools used for literature review (citation and literature management), presentation, etc. Also used for APA citation management and proper referencing.

### **Analysis of Learning Outcomes**

This section matches COMP602 – Part 2 learning objectives to evidence showing successful completion. As you will see, the evidence is found in one or more of the following:

- (1) Links to main documents (Research article, research presentation or research design)
- (2) Links to Landing posts (reflections, discussions, etc.)
- (3) Research Portfolio ( i.e. this document’s further discussions and reflections)

### **Outcome 1 - Analyze business data needs and requirements for data-driven systems.**

Business data needs for the research project were analyzed in two phases. The first phase (Part 1 of the course) and involved traditional business analysis and requirements gathering around the docRM (CRM) platform. Recall that the docRM scenario involves my current employer and I was provided access to business personnel. A discussion was held with key business users and the high-level requirements documented in various COMP 602 – Part 1 deliverables (documents such as the ERD, scenario description, security, resiliency, etc.).

The second phase of the analysis was focused on moving beyond operational use (transactional) and into analytical reporting. Phase two requirements helped shape some of the entities in the original ERD such as including the interaction type (web, phone, email) and interaction times (start, end) as it was felt those attributes would be used in future KPI’s. Phase two of the business analysis was completed once my research topic was formed. It quickly became clear that the research study should focus more on business readiness and less on prototyping analytical techniques. The research paper found that analytics

projects have a high degree of failure and mitigation steps should be followed to ensure objectives are aligned with organizational maturity (Reifferscheid, 2015).

The business requirements included in my research study minimally involved real-world business personnel due to time constraints and access. However, my tenure and experience at the organization allowed me hypothesize the analytical business objectives as well as organization readiness for such an initiative. In a true implementation, the business should be more engaged and involved.

Evidence Summary – Outcome 1
<i>Research Paper</i> – The research paper (section 2, 3, 4, 5) is a continuous evaluation of business data requirements.
<i>Research Design</i> – The research design paper discusses research questions and methodology. The research questions and methodology are formal documentation of high level business requirements (and linked to the original scenario). See page 2, 3 and 4 of Research Design.
<i>Research Portfolio</i> – The <a href="#">‘Research Project Overview’</a> of this paper outlines the key business objectives of the original scenario.

**Outcome 8 - Argue the strengths and weaknesses of different approaches to data management.**

The research paper itself is an argument outlining the strengths and weaknesses of Data Analytics approaches (i.e. techniques). Data Analytics techniques (i.e. the focus of the research paper) are themselves are approaches to ‘data management’. The research paper’s problem statement sets the tone for the research papers arguments. The problem statement is directly addressed by recommending three techniques (see Table 8.a below). The research paper also justifies the reasons why these recommendations were made in favor of others (i.e. makes an argument) in Table 5 (research study p. 14).

Table 8.a – Analytical Recommendations
<i>(1) Data visualizations</i> – this technique would be utilized to present real-time measures of docRM interactions. The measures could include (active calls, number of calls per hour/day/week, mean time to closure, etc.). This reporting would be highly visualized to in a dashboard and drill down approach and would allow for ad-hoc decision making. Visualizations may aggregate a number of underlying metrics to come up with a customer satisfaction or sentiment score.
<i>(2) Predictive analytics</i> – this technique would assist in predicting future workload of service interactions. That measure would allow the organization to set and reporting compliance on target goals (KPI’s) for support satisfaction. Decisions to add or train support staff could me made based on the analysis.

**(3) Text analytics (mining)** – this technique would allow the organization to leverage large amounts of unstructured data (email, docRM interaction comments fields). This technique also makes use of Natural Language Processing (NLP). Text analytics has potentially the most value of the three initiatives and may allow the organization to score sentiment as a part of the satisfaction score.

Source: (Reifferscheid, 2015, p. 13, 14).

In addition to the explicit recommendations, the ‘Literature Review’ section of the research paper surveyed existing literature, identified successful implementations (two examples provide) and challenging areas (high degree of failed BI projects, privacy and performance).

While participating in the weekly action sets, the discussions often led to different approaches to data management (e.g. real time, geo-mapping, security, etc.). One action learning set discussion identified my scenario to potentially have privacy challenges. Previous to this discuss privacy had not been a large part of my research paper.

Lastly, Landing discussions are also provided as evidence for this outcome.

#### Evidence Summary - Outcome 8

*Research Paper* – The discussion section of the research paper is related data management techniques (sections 2, 3, 4 and 5).

*Landing Posts* – See discussion on a fellow students approach to database security.

(<https://landing.athabascau.ca/pages/view/1312733/week-7-reflection>).

### **Outcome 9 - Solve problems in technology, technique & process relating to database management & design.**

The research paper and the research design paper solved problems in technology, technique and process. The research paper goes into detail in each of these three areas with the problem statement and research questions focused on these three exact concepts. Tableau (Analytics Software) was used to present docRM example data and shown in the presentation and Appendix A of research paper (p. 18).

Beyond the technology, technique and processes discussed in the research paper itself, there is the meta-process of researching and writing an academic paper. This process requires problem solving (determining paper structure), technology (searching online libraries), validity, and research management (Mendeley). The research design paper addresses those items.

Evidence Summary - Outcome 9
<p><i>Research Paper</i></p> <ul style="list-style-type: none"> <li>- Process – discusses a process to following to implement analytics programs (page 10).</li> <li>- Technology – lists various technologies/techniques (page 9) and later makes recommendation (page 13, 14). See Tableau dashboard (Appendix A p. 18).</li> <li>- Technique / Approach – discusses an approach to evaluate an organization and implement and proper analytics program (page 8).</li> </ul> <p><i>Research Presentation</i> – The presentation shows the used of Tableau BI software to show an example docRM visualizations (page 12).</p> <p><i>Research Design</i> – discusses problem solving processes related to building the research paper.</p> <p><i>Landing Posts</i> – Weekly reflections in my personal wiki iteratively solved problems that arose relating to technology, technique and process. This process also assisted the COMP 602 community in problem solving (I learned tools and techniques from others and vice versa).</p>

**Outcome 10 - Independently & reflectively research issues, technologies, processes & tools in IM.**

The research project is an independent research of issues, technologies, and tools in Information Management (specifically Data Analytics). A full review of the research paper provides much more detail in this regard. A summary of this is provided below:

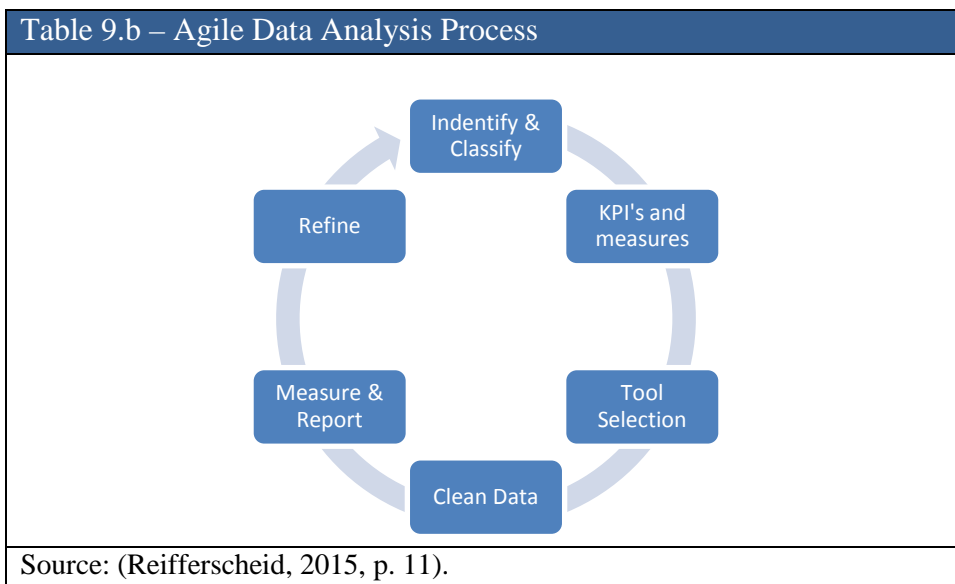
**Technology/Tools** – Technology plays a big role in Data Analytics. The research paper investigates the major tools in this space (see Table 9.a and Appendix A p.18). Additionally, the research paper discusses OLTP, OLAP and ETL technologies (research paper sections 3, 4).

Type	Description	Vendors
Giants	Large and long-established BI players.	IBM Cognos, Microsoft, Oracle OBIEE, and SAP Business Objects.
Established	Focused on BI software and services, decades or more in the business.	Actuate, Information Builders, MicroStrategy, IBM SPSS, SAS.
Challenging	Gaining market and are growing at an extremely high rate.	Qliktech, Tableau, Tibco Spotfire.
Emerging	Younger startups offer unique business models, technologies and/or services.	Acrplan, Dimensional Insight, Datawatch, Druid, Mattersight, OpenNLP, Jedox, Pentaho, Jaspersoft and Yellowfin.
Adapted from: Gartner (2015); Reifferscheid (2015); Yellowfin (n.d.).		



**Techniques** - The problem statement and research questions speak directly to technique and various techniques were researched. Three techniques were recommended to solve (or meet) an organizational need with respect to Data Analytics. See section 5 – ‘Case Study’, on pages 14 and 15 in Reifferscheid (2015).

**Process** – An entire section of the research paper was dedicated to process relating to database management and design. Process was identified as a key driver to successful Data Analytics initiatives. An example agile process was developed. The docRM analytics scenario was then walked through this process and ultimately assisted in generating the papers recommendations.



Evidence Summary - Outcome 10
<p><i>Research Paper</i> – Outlines technologies/tools (p. 9, 10) and processes (p. 10, 11) in Information Management. The case study recommends techniques in docRM scenario (p. 13, 14).</p> <p><i>Research Design</i> – Outlines the processed used in building the research paper itself.</p> <p><i>Research Portfolio</i> – Salient points are pulled from main documents and presented above.</p>

**Outcome 11 - Critically evaluate information and data technologies in the context of organizational needs.**

The research paper, in all sections, consistently relates the research and conclusions back to the organizational needs. Additionally, the research paper is a critical evaluation of technologies weighting

out strengths and weaknesses of each data technology. Section 5 – ‘Case Study’ of the research paper (see Table 8.a) puts forth recommendations based on the information learned in the previous sections.

The research design document also formally captures organizational needs in the research questions objectives.

#### Evidence Summary - Outcome 11

*Research Paper* – The research paper continuously (in each section) refers back to the business requirements.

*Research Design* – Research was designed to fit business organization needs.

*Landing Posts* – The organizational needs of other student’s scenarios was also examined and evaluated. Numerous posts commenting on other student work were provided on the Landing.

#### **Outcome 12 - Be a reflective practitioner in the information management field.**

Part 2 of this course saw the continued use of reflection to strengthen the pedagogy experience.

The following table outlines the reflection discussions used to achieve this outcome.

#### Evidence Summary - Outcome 12

*Research Portfolio* – This paper contains two additional reflections:

- [Research Project Reflection](#)
- [Course Reflection](#)

*Landing Posts* – see following posts:

Week 10 Reflection: <https://landing.athabascau.ca/pages/view/1317145/week-10-reflection>

Week 11 Reflection: <https://landing.athabascau.ca/pages/view/1327162/week-11-reflection>

Week 12 Reflection: <https://landing.athabascau.ca/pages/view/1327214/week-12-reflection>

Additionally, all reflections have been attached in [Appendix A](#) of this document for offline viewing.

#### **Research Project Reflection**

The research project involved four main deliverables, the research paper, research design document, research presentation and a research portfolio (this paper). The project and theoretical research was a shift from the practical components of Part 1 of this course (RDBMS scenario). Part 1 of the course resulted in a positive learning experience full outlined in the Foundations Portfolio. The research project

(Part 2) proved to be an excellent learning and resulted in furthering knowledge in areas that interested by me and were applicable to projects at my current workplace. Research can be tedious and exhausting; however it can also be fun. Gaining experience using scholarly libraries as well as reading and consuming academic research material has allowed me to start enjoying this activity. I see myself as a pragmatic practitioner and theoretical research pushes me outside of my comfort zone (although less and less with each paper).

The research paper itself is a high-level overview and I had to make a conscious effort to keep it that. My tendency was to expand the research and implement prototypes, however time and assignment requirements (2500-3000 words) did not allow this. I feel the paper does a good job at highlighting the data analytics techniques and also discusses organization strategies. During the process of writing the paper it became clear that perhaps the most important part of analytical initiatives is not the tools or techniques but rather the strategies, approaches and organization readiness. To properly recommend techniques, I often had to re-examine the business maturity and objectives.

The presentation is a very brief overview which I suspect is meant provide an 'abstract view' and thus encourage students to follow up on areas of interest. I do intend to read other students research papers when time permits. The Landing also allowed me to read other research papers from past years; I found this to be extremely helpful.

### **Course Reflection**

This will be my final reflection for COMP 602 and provide a macro level overview of what was learned and gaps that may remain. Ideally, through a continuous learning and inquiry process, some of these gaps will be closed. I can honestly say that I have achieved success in expanding knowledge in ERD modelling, normalization and PostGres database management. Before the course, I had scored myself relatively high in these areas. Certain areas required me to re-learn concepts and methods as well as break bad habits. The key value item in part 1 was focus on keeping the context of the

NoSQL and the research project were an enjoyable endeavor. This allowed expansion beyond RDBMS into new and fresh areas. While I see the value of the efforts in part 1 of course, part 2 allowed me to broaden my skillset and knowledge. Information management beyond relational models is becoming more and more of a part of my professional life and I look to continue to expand my knowledge in this area.

## References

- Athabasca University. (2015a). COMP 602 Course Information. Retrieved from <http://comp602r3.athabascau.ca/project/index.php>
- Athabasca University. (2015b). COMP 602 The Project - Indicative Grading Criteria. Retrieved from <http://comp602r3.athabascau.ca/project/indicative-grading.php>
- Faraday, P., & Sutcliffe, A. (1997). Designing effective multimedia presentations. In *Proceedings of the ACM SIGCHI Conference on Human factors in computing systems* (pp. 272–278).
- Radel, J. (1999). Effective presentations. *Kansas University Medical Centre*. Retrieved from <http://www.kumc.edu/SAH/OTEd/jradel/effective.html>
- Reifferscheid, K. (n.d.). Research Project – Data Analytics. Retrieved from <https://landing.athabascau.ca/pages/view/1325902/research-portfolio>

## Appendix A: Reflections

### Appendix A

#### Unit 10 Reflections

The following is a weekly reflection post for this unit.

#### Weekly Reflection 10 (Offline Viewing)

Landing Link: <https://landing.athabascau.ca/pages/view/1317145/week-10-reflection>

#### Reflection

This week has been heavy in research and reading (and more to come). Additionally, I've spend a significant amount of time on the structure of my research project. It is clear the research proposal must be tied back to the original scenario. With that in mind I've come up with the design shown below. I may have bit off more than I can chew, however I do not know where to cut at this point.

Additionally, through the Action Learning sets meetings, I plan to discuss this and get feedback. On that note, I've am somewhat familiar with Action Research (through 695) however this is mostly a new concept for me, seems to be analogous to agile software development paradigm.

#### Research Design

**Scenario:** The docRM scenario includes three over-arching objectives. The first objective relates to traditional CRM capabilities (completed in part 1 of COMP 602) and speaks briefly how the data may be used in future offers. The latter two are tied specifically to data analytics and will be the primary focus of this paper:

Streamlining engagement (central point of contact, one common system). Use the docRM data to derive metrics on interactions and services offered. This would then be used for decision support and to address areas of need.

Through data analytics, develop a better understanding of physician members. Developed a core competency in-house and report on items such interaction frequency, interaction type and potentially correlation of interactions to demographical information (age, gender, specialty).

Combine docRM metrics with other information system data to provide a holistic member view/dashboard.

**Methodology:** Qualitative meta-analysis incorporating a Case Study (i.e. the scenario) examination.

#### Structure:

##### Abstract

- Include problem statement

##### Introduction

- Include details about scenario
- Highlight structure of rest of document

##### Related Research (Literature Review)

- Discuss research trends
- Discuss successful Data Analytics Implementations (try to match close to scenario)
- Data Analytics Challenges
- Summarize Key Points

##### Analytical Strategies and Techniques

- Organizational Readiness – discuss maturity levels of orgs and place docRM's org in a bucket.
- Analytics Goals (DocRM)
- Analytics Techniques – discuss possible techniques that could be used (utilize it review & organization readiness)
- Data Analysis Implementation Approaches

Discuss steps in approach in detail, relate to scenario

- Six step or process identified .... Explain each one.

Case Study: Data Analytics in docRM

- Choose specific approach and justify (include strengths and weaknesses of approach)
- Simple proof of concept (if space/time) with tools of choice on top of docRM data
- Future Possibilities

Conclusion

References

## Unit 11 Reflections

The following is a weekly reflection post for this unit.

### Weekly Reflection 11 (Offline Viewing)

Landing Link: <https://landing.athabascau.ca/pages/view/1327162/week-11-reflection>

This week has been a continuation of research and writing the research proposal. I participated on an action learning session with two fellow students and Dr. Dron. The feedback helpful in refining my research questions and problem statement. I would recommend this session for those who have yet to participate.

At this point my research project is mostly completed and is in the polish stages. I have moved on to my project portfolio and presentation. I was concerned that the project portfolio would take as much time as the foundations portfolio so wanted to get an early start to this. Also, I felt that I should have created the foundations portfolio earlier in the course and added to it each week. This would have spread out the effort level. That said, doing it at the end of Week 9 allowed me to have a more complete reflective view.

Looking forward to the project I see that we have 5 minutes to present. With those time constraints it is obvious that this will be a high level general overview. I've been reviewing other students research posts and am looking forward to their presentations. During the next few days, I plan to do some basic research on effective presentations. While I've done many presentations, I've never put much effort into presentation design. A few of the articles that I have skimmer are here. For the second article, follow the links at the bottom to other sources.

Faraday, P., & Sutcliffe, A. (1997). Designing effective multimedia presentations. In *Proceedings of the ACM SIGCHI Conference on Human factors in computing systems* (pp. 272–278).

Radel, J. (1999). Effective presentations. *Kansas University Medical Centre*. Retrieved from <http://www.kumc.edu/SAH/OTEd/jradel/effective.html>

## Unit 12 Reflections

The following is a weekly reflection post for this unit.

### Weekly Reflection 12 (Offline Viewing)

Landing Link: <https://landing.athabascau.ca/pages/view/1327214/week-12-reflection>

This week involved me further refining my paper and portfolio. Refining the document was mostly focused on ensuring the document had a logical flow and also proper APA formatting. I also put all of my informal research design notes into one document. I felt the design document was necessary to keep me focused on right path. Additionally, it may help others understand my research paper in a little more detail. I find the more research papers I write, the more time I spend ‘designing’ rather than ‘writing’. If I take the opposite approach, the paper ends up being a complete behemoth which I then need to pare down and include what is related to addressing the research questions and problem statement. I am hoping to, at some point in my life, find a happy balance here.

The research design document can be found here:

<https://landing.athabascau.ca/pages/view/1348522/research-design>

This week also saw me further refine the problem statement and research questions. I realized that my ‘research statement’ was actually a question and not a statement. Also, I included all my identified research questions in the research design document.

Additionally, the research design document includes a description of methodology, uniqueness, validity, and research management. For those that are looking for a good citation and literature management tools, I would recommend Mendeley software. I’ve been using it for a few months now and I won’t go back to the manual approach of citation/literature management.

My presentation is in a first draft form. I am currently at approximately 13 content slides and to meet the course limit of 5 minutes, I will either have to fly through the slides or reduce content. Still on the fence on this one as I feel that the 13 slides are required to give proper insight into the paper.

The first draft research presentation can be found here:

<https://landing.athabascau.ca/pages/view/1348574/research-presentation>

As always, comments are welcome.