

Trimester Assignment

by Yasin Cakar

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1 Trimester Assignment

The Assignment takes the form of a report that the author prepares for a C-level manager (e.g. the CEO, COO, CTO, CFO, ...).

The report will:

1. (a) *Describe* a business problem that is prevalent in industry or government, and
(b) *Argue* why it is strategically relevant to solve it
2. (a) *Choose and explain* the essence of a new / innovative technology or method*
(b) *Convince* the reader that this technology or method is able to solve the business problem

This can be done by finding, reading and citing facts and findings from reliable peer reviewed sources (such as books and journal articles, or conference papers), and to a limited extent sources from reputable companies. (Blogs and similar opinion pieces are not considered reliable.)
3. *Propose* an approach that a company could take to adopt the solution to solve the business problem in question
4. Provide a summary of your paper's main points

The assignment can be prepared individually or in a group of maximum 3.

Essentially, the report you prepare is a so-called 'white paper'.

A template is provided below, please use it.

There is no strict limit on word count but usually ~2500...3000 words are adequate

* Examples may include: Internet of Things, Creating a Digital Twin, Business Analytics and Machine Learning technologies, Service Oriented Enterprise Architecture, Cloud Computing and Data Lakes, Process Improvement and selecting a suitable method to achieve, or other significant technologies (in which case you must discuss your idea with the lecturer before you progress too far).

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1. The business problem

Explain clearly and succinctly

- a. a business problem that needs to be solved, and
- b. why is the change strategically important?

This part of the white paper raises the interest of management by presenting an important problem that many enterprises are (or will be likely) facing. Note that a white paper is not about a single company, it is about a problem that is prevalent in a segment of industry.

The business problem that is addressed in this document is the impact on tertiary institutions after the recent Corona Virus pandemic, universities are expected to have reduced staff numbers after a projected loss of up to 21,000 full time jobs for the last year (Witze, 2020, p. 164), this has consequently significantly increased the workload of remaining staff according to a Griffith University Survey (National Tertiary Education Union, 2020).

These drastic changes have forced many organisations to downsize office spaces making staff work remotely in compliance with regulatory requirements to ensure the safety of staff from the ongoing pandemic. This new normal of the hybrid workplace is expected to persist after the pandemic (Dimensional Research, 2020).

Studies have shown that there were no significant difference between face-to-face and online courses in terms of satisfaction and academic performance (Soesanto & Bonner, 2019), however these are the findings prior to when the pandemic was first reported ("Coronavirus disease (COVID-19) update," n.d.).

Whilst there are extreme claims of which teaching delivery mode is the best online, face-to-face or blended learning (Zhang et al, 2020). There is a reality that tertiary institutions are facing world wide, the reality going forward is that online and blended mode teaching will remain to be the new standard method of teaching.

This reality brings new challenges as students worldwide are showing trends of dropping out of tertiary education, in Japan university attendance has dropped by 12%, the reason behind this trend is university students experiencing job scarcities (Kakuchi, 2021). The same trend can be seen in the United States where attending a four year degree has sunk by 18% and a quarter of students have postponed college (Dickler, 2021).

The reality in Australia is not so different from the rest of the world, as a loss in revenue for Australian Universities of three to five billion that was projected for 2021 that heavily rely on fees from international students from China (Witze, 2020, p. 164).

A strategic change is necessary to provide pain relievers for students, university staff and the organisation itself, according to the value proposition model below. The strategic change is necessary to relieve staff workloads after cutting back on full-time employees. Students in Japan were also dropping out due to a "debilitating loneliness" given the lack of campus life as well as financial difficulties, a recent article reports that students have begun to assess universities based on the quality of support services and enriched campus activities (Kakuchi, 2021).

The proposed strategic change is aimed at providing an effective, if not niche solution, to relieve staff and students and in the process increase the organisations revenue and enhance organisations goodwill reputation.

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2. The proposed technology (or method, approach, ...)

- a. explain clearly and in a language appropriate for a management audience what is the proposed technology (or method), then
- b. argue and provide proof that it is expected to solve the business problem (typically you would provide proof by citing authoritative references).

A white paper is not a plan for a particular company, but after reading a well written white paper management may ask someone in the company to come up with a company-specific plan to determine if what the white paper is saying would be able to be applied in the organisation.

The proposed method the deal with the issue mentioned above is a interactive AI application, this document proposes that enterprises invest in a pilot design of an interactive enquiry software that utilises Artificial Intelligence, this software will be referred to as "AskUsAI" in this brief. This design will aim to initially work in parallel with the universities ask us in its earliest phases, the beta trials, before becoming the new standard leading global enquiry technology solution in its final version, through evolutions of product development iterations.

This artificial intelligence software is to be an enquiry handler that works interactively with voice, graphical user interface with natural language processing capabilities. The solution software is to be hosted on the cloud as a Software as a Service.

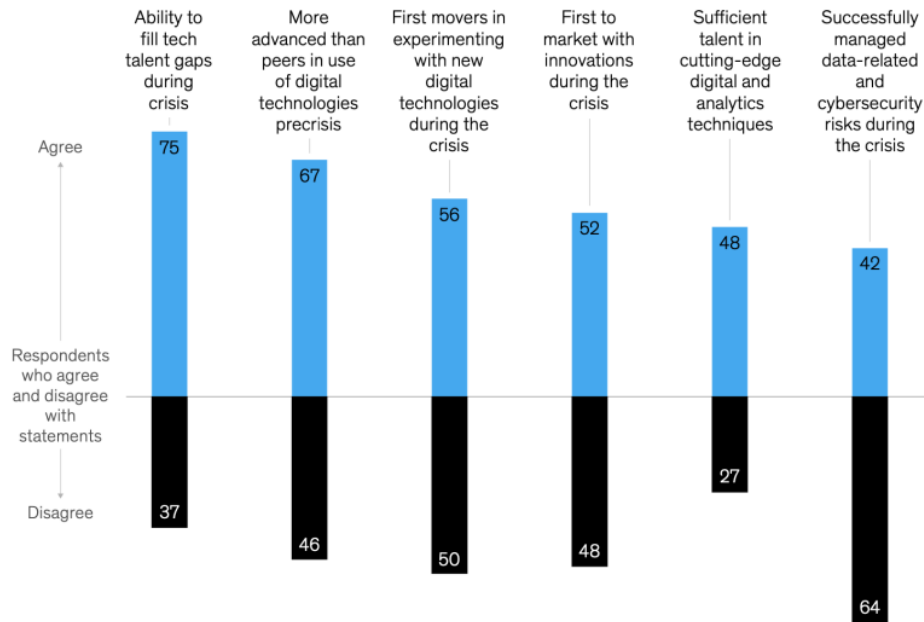
Initially this software solution will solve common enquires that are repeated by staff, student and other affiliates every year due to the systems (or system of systems) structure that is present within any given large enterprise. The AI system or AskUsAI solution will serve as an interactive enquiry kiosk, that can handle general enquiries as well as very specific and specialised questions, or queries that need user authentication, for very specific enquires in the initial phases users may need to be redirected to the student services department. Very specific enquiries will be forwarded to the specialised or dedicated staff members who's domain the enquiry relates to.

As the technology matures with its machine learning capabilities, it is expected that the technology can handle all reasonable and authorised queries according to the rules and policies of the information architecture, and queries that depend of specialist or specific staff will be redirected to respective staff member of the enterprise.

As the pandemic has brought many risk and changed the landscape of the workforce, this phenomenon also brings opportunities to for organisations to emerge as leading enterprises with the right digital strategies, after the recent emergence of hybrid workplaces the differentiator of successful companies is talent, adoption of cutting-edge technologies as well as other capabilities to stay competitive (McKinsey & Company, 2020). Many organisations experiences unprecedented rates of digitisation, years of digitisation has now been accomplished in a few months. Companies' digitisation has accelerated 3-4 years and by 7 years for internal operations and digitally enabled products in their portfolios respectively (McKinsey & Company, 2020).

During the crisis, the most successful organizations report a range of technology-related capabilities that others lack.

Differences between organizations that implemented COVID-19 responses very effectively and all others, % points



Enterprises must restructure their processes to optimise their performance in the post-Covid era. According to a global survey on the digital strategies of corporate enterprises, the report outlines that remote working is likely to remain after the pandemic according to 70% of respondents. In the same report 80% of customer interactions are expected to be digital in nature (McKinsey & Company, 2020). The report also highlighted that working remotely was much less likely to meet customer expectations of organisations. The findings suggested that organisations respond with digital strategies that are responsive to increasing demand for online interaction and changing customer needs. The report states investments in artificial intelligence systems was one key changes that positioned organisations better than they were before the crisis (McKinsey & Company, 2020).

Before the pandemic many courses were being taught in blended modes, meaning at least one course was taught online, this mode of education had increased by 34.7% of the total learners population in tertiary education worldwide. After the pandemic was announced in December 2019, colleges and universities faces shut downs leaving 1.2 billion students out of classrooms (el Said, 2021). With the rapid increase of digitisation and students transitioning to studying online, the same reality is also the case for students, where online distance learning is expected to be the standard mode of content delivery and the main learning platform, as is hybrid workplaces.

Therefore the initial rollout of a successful iteration of the AskUsAI system may be a viable pull factor for companies seeking organisational success.

As graphical processing unit have enhanced and become cheaper, cloud computing has become more prevalent, and big data is more common due to cheaper storage than before, the so called AI winter is certainly no longer a reality, in today's technology "many thousands of AI applications are deeply embedded in the infrastructure of every industry" (Kurzweil, 2005, p.264).

In order for Organisations to become industry leading tertiary education institutions, they must be able to effectively maintain their business processes with reduced office sizes, while keeping tertiary students engaged with the enterprise with reduced staffing. Such need to maintain optimum performance in the business processes will require automation that Artificial Intelligence can effectively handle.

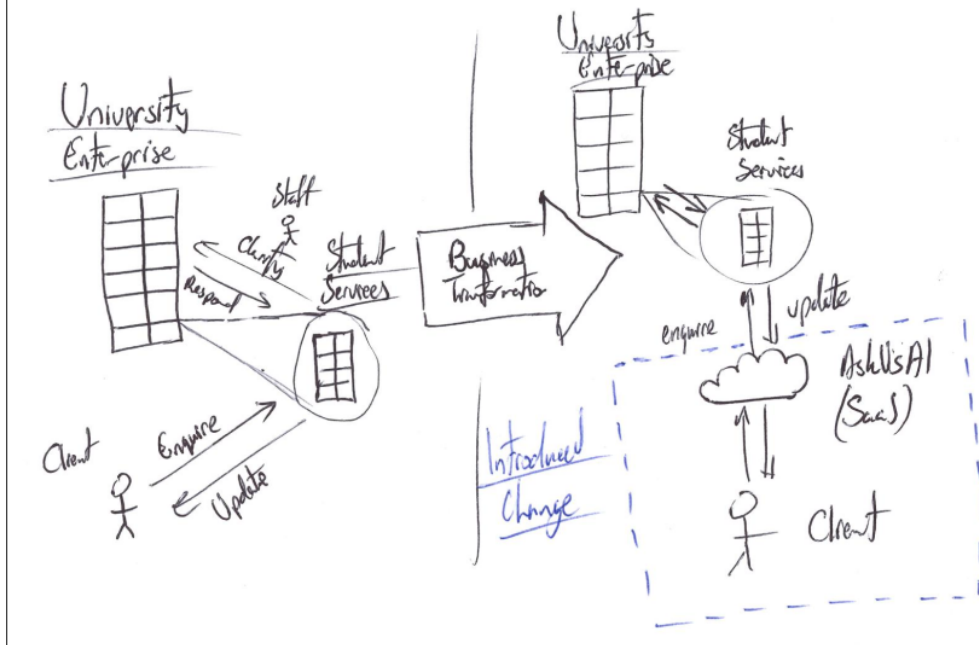
Artificial intelligence is not only increasingly more prevalent than before but at a mature state than ever before. The current state of AI technology is that there are AI algorithms that know a person better than their co-worker with by only analysing 10 likes from their Facebook. With 70 like the algorithm knows a person better than their friends, with 150 likes it has the potential to know a person better than their own parents, and with 300 likes the algorithm knows the user better than their partner (Walker, 2017, p.13).

The current state of AI technology has advanced considerably that today's concerns are no longer if AI technology will pass the turing test but rather what measures can be put in place so the technology does not pretend to fail the turing test (Walker, 2017, p.4).

Artificial intelligence can also be coupled with machine learning and big computing power to improve its own performance as well as perform data analytics to support the enterprises ERP system to drive unprecedented business results and data analysis for long-term planning.

The successful implementation of this technology can be expected to receive appreciation as a feature that is an excitement requirement according to the Kano model, however over a very short period of time this technology will become a basic requirement.

Therefore mature organisations are strongly advised to be early adopters in implementing the suggested cutting edge technology solution proposed, the proposed architectural transformation is illustrated below.



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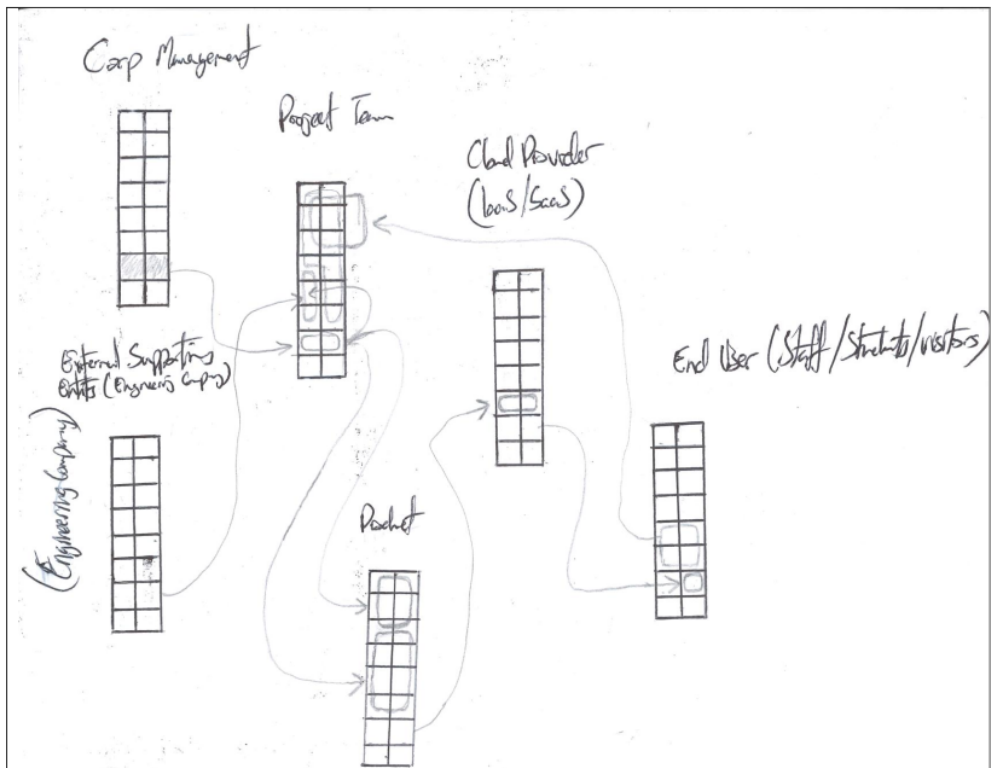
3. Introducing the proposed change in the Enterprise

3.1 Where in the enterprise will this change have an effect, and what kind of change one could expect?

E.g. think about possible change of the business model, or organisation, technology, people / skills, processes?

The proposed change in developing the proposed technology solution is intended to initially function in parallel with the organisations existing department that is responsible to handle enquiries of its customer base, the tertiary students. As the application matures through iterative developments as well as utilising its own machine learning capacity, the application should reduce the workload of existing staff dealing with this process, eventually as it serves reduce the workload in future iterations the software will be expected to reduce the number of staff members who actively handle enquiries to a smaller set of staff that monitors and manages the AskUsAI system.

The entities involved in introducing the proposed changes are include corporate management, the project team driving the changes, the engineering company that supports AI solutions development, which will be the external supporting entity, the product itself which will be deployed on the cloud to be utilised as a service, a Software as a Service(SaaS) to external customers.



The main entity and beneficiary will be corporate management that will decide such a transformation is necessary to stay ahead in the industry given the challenges imposed. Corporate management will be responsible for the governance of the architectural transformation.

The second entity is the project team, who will be responsible for continuous improvements and will take the role of managing the transformation and reporting to the governing entity. The role of the project team is to develop the product to fit the business goals and vision by ensuring they are developing the right product as well as developing the product right (Popentiu, 2001).

The external supporting entity is engineering company that provides expertise procured by the performing organisation to assist the project team to translate the product requirements into an effective detailed design that leverages AI technology to provide a feasible and optimum solution.

The remaining entities are final product, the cloud provider and the customers involved. The software deliverable is a software as a Service (SaaS) deliverable that will be hosted on the cloud for customers and other potential customers to utilise.

As the technology matures with its machine learning capabilities, it is expected that the technology can handle all reasonable and authorised queries according to the rules and policies of the information architecture, and queries that depend of specialist or specific staff will be redirected to respective staff member of the enterprise.

In the early days of the rollout of this technology it is advised that it works in parallel with the Universities student services. Initially the technology can be presented as a convenient alternative as a beta version on the organisations official site for the intended audience.

Initially the pilot version of the *AskUsAI* product will be to provide a convenient alternative that is always on with high availability and bandwidth to support multiple and concurrent interactions with the intended users, that is device and platform independent.

When the proposed change is first rolled out it is not expected to have a major impact on the internal processes of the performing organisation that is developing the solution proposed. The first design will serve as a minimum viable product for the organisation, as the technology is incrementally developed towards the final version the solution can be expected to relieve majority of the workload of the student administration department, as workloads for present staff is completely relieved by a an automated system that is an always-on, high availability, highly responsive and interactive alternative that is operational regardless of the office hours of the organisation.

3.2 What are conditions for being able to perform this change?

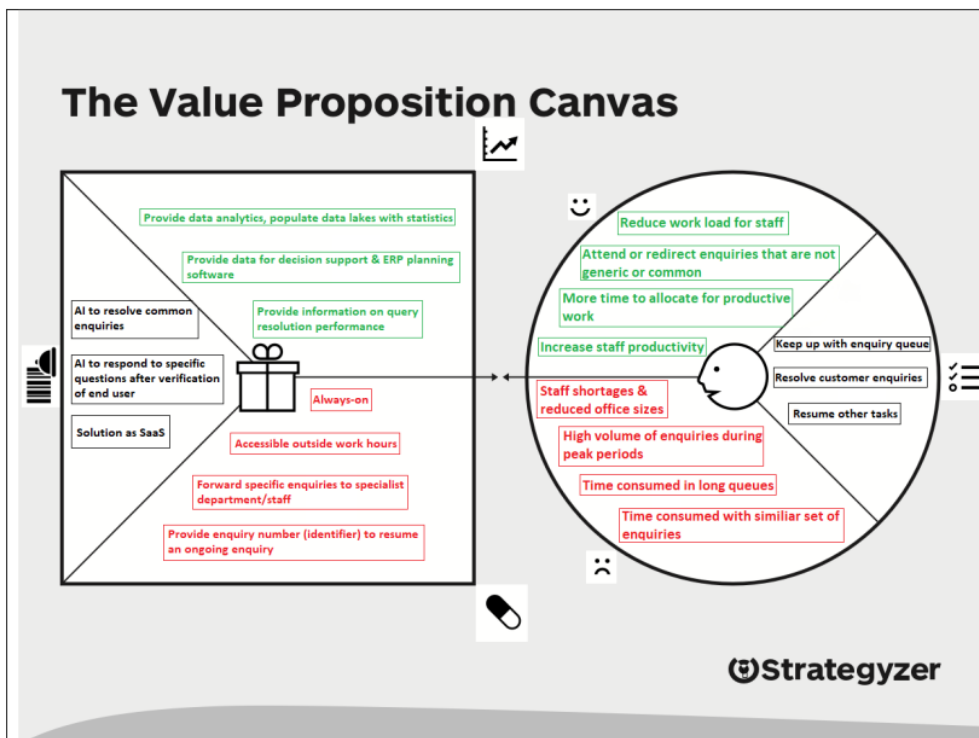
Note that these 'conditions' may include many things:
technological maturity,

- maturity of governance and management,
- availability (or access to) necessary skills,
- typical organisational or policy / legal obstacles that need to be overcome,
- ability to financially afford the change, or
- any other obstacle that is typical.

In order to perform the proposed transformation illustrated in section 3.1, the performing organisation needs to satisfy a minimum capability where it has the capacity to monitor its enterprise's performance, recognise trends, the change required to keep up with these trends and have the capacity to allocate resources for the identified change. The entity needs to be able to assess its situation and be aware of its limitations and have the authority and resources, or be able to procure such resources to realise the necessary change.

The entity that intends to adopt this proposed change to optimise its digital strategy must have a maturity level of 5, known as the *Optimizing level* (Chrissis, Konrad, & Shrum, 2011), where the enterprise can govern a project with the necessary guidance and principles.

The enterprise that intends to make such transformation must have an architecture management capability, where it can employ a process to develop instructions and plans to guide the architecture concept to be realised. The architecture conceptualisation according to the ISO 42020 standard requires the specification of the objectives of the architecture, and quality measures to assess the value of the proposed solution. In the case of this study the objectives and the value added can be summarised with the value proposition model shown below.



The Organisation must therefore have the Architecture evaluation capability to assess that the proposed solution is able to support the enterprise goals, policies, principles and strategies. This evaluation must be performed independently to obtain objective and accurate results, that is the evaluators must be a separate set of people from those who developed the architecture concept.

If such evaluations are found to be inconclusive at the time of the assessment, additional modelling and evaluation is advised as part of Architecture Elaboration (in accordance to the ISO 42020 standard) to complete the evaluation process.

In the process of this transformation the Chief Information Officer is responsible to overlook the information system transformation, and through management and governance that the project team is delivering the intended solution that satisfies the goals and objectives of the enterprise.

The main legal requirement this architectural transformation needs to consider is conformance to legislations regarding the management of personally identifiable information. This requires the information architecture to have policies, rules and implementation of this in accordance, that adhere to effective security and privacy principles.

The major benefit of this technology besides from the benefits mentioned includes providing the best measures in compliance with the State Governments and Health Departments COVID safe measures as it minimises face-to-face interactions.

The Chief Financial Officer will be responsible to assess the value delivered of the proposed solution with respect to expert estimates of the delivered value (or cost saving in the long term) provided by the technology. These assessments need to make projections using historic data and trend analysis based on the facts provided in this document. Estimation models need to be utilised to make a comparison of the current budget and financial baselines with respect to projected growth, and thus perform a gap analysis to

obtain insight of potential value between the current and projected state after the proposed transformation.

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3.3 Who would be responsible for initiating the necessary change?

The project will commence once the architecture evaluation has been verified by the corporate committee before any project proposals are considered.

A project proposal will be the initial step to identify the need for such organisational change. The project manager assigned with the task by the CEO and CIO as the project sponsors will need to have an initial meeting, this meeting may also be referred to as an iteration zero meeting which will be conducted before any formal work. In this meeting the project scope is defined and the stakeholders are formally identified.

After the scope is defined and agreed by the project team the external supporting organisation, the solution architect, and the executive committee, the agreement will be documented. The enterprise will have its scope objectives in the Project Proposal document (PPD), or as equivalent document, and the Project Initiation Document (PID), or its equivalent after a successful outcome of the initial meeting.

The champion of the transformation will be the Solution Architect who will liaise the process to meet the Architecture requirements defined by the process in Section 3.2

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Who in the organisation would be the typical champion and sponsor?

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3.4 How could this change be approached organisationally?

E.g. Project? Programme with a sequence of projects, steps? (make sure you explain why)

The proposed solution is intended start with a minimal effect on the organisation when the technology is first rolled out. As the project matures it is expected to handle tasks of a whole department and drastically add value in assisting the organisation with data analytics capabilities for the enterprises long term planning endeavours.

The most effective use of this technology will not only be the benefit of harnessing the power of AI in its assistance to the end user only. The proposed transformation intends to develop data analytics capabilities using its innate machine learning capabilities as well as populating data lakes with valuable statistics. The data analytics capability of this transformation is to deliver enhanced enterprise resource planning data assets.

In order for the enterprise to utilise such capabilities Organisation must be able to utilise the Unification Operating model in order to make maximum benefits in terms of information quality and process efficiency (Górski & Bednarski, 2013).

The enterprise may only need to develop service infrastructure to interface between the existing organisations database and the AI application hosted on the cloud. The services application must conform to the constraints and rules on authorisations and privileges defined by the information architecture.

The services applications need to be designed to enable information system modularity where the application is split by functionality with a thin layer present to translate function calls in the database

management system and the overall software framework. This is advised to keep the new system modular and adaptable to future modifications and upgrades.

In order to achieve this transformation successfully to meet the enterprise goals and provide a return on investment, one possible approach is to incentivise development efforts for project architectures as implemented by Toyota marketing Europe (Ross, Weill, & Robertson, 2006). The incentivisation of Toyota marketing Europe was to judge solutions using an ordinal scale where achievements were enumerated as "nearly achieved", "fully achieved", and "exceeded" goals. This approach was effective in cultivating ownership and accountability by architects as well as assist in the architecture evaluation process.

4. Conclusion

The findings of this paper points out the expected prevalence of difficulties to be imposed on employees and clients of University institutions due to necessary reduction of staff members, courses increasingly moving online as a permanent long term trend in the future. As the industry has faced year's worth of digital transformations in a matters of months, this document explores the new challenges tertiary institutions will be facing.

This paper has identified a technology solution pathway that address an ongoing problem that staff and students, as well as establishing a new means of consolidating a strong customer base whilst supporting the enterprises' employees.

The proposed solution is intended to become a permanent solution for the performing enterprise that is functional twenty-four hours, seven days, all year round with high availability and always on. The solution is also intended to provide the organisation vital data analytics capabilities based on the number, type, frequency as well as the end user statistics for all enquiries.

The requirements of the organisation have been covered, whereby enterprises seeking such capabilities must meet the optimizing capability maturity level. This document also emphasised on the importance of the compliance officer's role in the organisation, as such a project carries risks related to privacy of its clients and the organisation itself.

Given the recommendations in this document including the evaluation of how this solution is to be adapted to the readers enterprise is competently assessed, the prospects of this proposal will be promising if the enterprise is mature enough to make bleeding edge innovations in interfacing existing data structures with the state of the art cutting edge artificial intelligence technologies.

The success criteria of the correct implementation of this technology is increased workflow efficiency within the organisation for employees. At the same time a win-win outcome is expected on the client end as student waiting times during peak periods of the year with enquiries are drastically reduced as the technology matures to an adaptable solution that accommodates organic growth in the organisation within company guidelines and principles.

REFERENCES

use APA6 style references

there are many sources to teach you APA6 referencing, e.g. an interactive tool is at

<https://www.griffith.edu.au/library/study/referencing/apa-6>

NOTE: it is not enough to list references here, you must *cite* them at relevant places *in the text!*

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