

**The University of Melbourne**  
**Department of Computing and Information Systems**  
**Individual Assignment Cover Sheet**

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**Subject Code and Name:** ISYS90048 Managing ICT Infrastructure  
**Assignment Title:** **Assignment A02**  
**Tutor/Instructor Name:** Malcolm Bertoni  
**Due Date/Time:** 11.59 pm, Friday 5, October, 2018  
**Submitted Date/Time:** 12/10/2018

Before submitting my assignment, I have:

1. Made a copy of the assignment and of any material submitted with the assignment
2. Ensured that my assignment and any material submitted are clearly identified.
3. Completed the individual academic-honesty declaration
4. Submitted an electronic version of the report to LMS

**Signed:** Tiange Wang

**Date:** 12/10/2018



# **ICT INFRASTRUCTURE PROPOSAL REPORT**

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[06/10/2018]**

**Report Prepared for Assignment A02**

**ISYS90048 Managing ICT Infrastructure**

**Semester 2, 2018**

# IT Infrastructure Proposal Report

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## 1. Background

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Argyll and Bute Council is an authority council area for Argyll and Bute in the west of Scotland. It dedicates to offer various services to the clients and residents in the area, including housing, council tax, and benefits (Argyll and Bute council, 2018). The Council led the ICT service since 2013. Based on the 2017-20 strategy, the Council will collect information through the approaches below:

- Allow clients participate in the design.  
The clients are welcomed to participate in the process of design, construct and implement to enhance the performance and client services.
- The designed integrated and standard interface.  
The clients and staff could communicate and access the information by various interface which contains face-to-face, online, text, phone and email.
- The service-oriented website.  
The good website should be designed to provide impressive services and experiences for clients.

According to the strategy, for the ICT services aspect, the primary measure Council provided includes establishing the solid infrastructure and developing the digital transformation programme through Pathfinder North network and data centres to improve the efficiency, save the budget and enhance the quality of services for stakeholders.

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## 2. Nature of this Report

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### 2.1 The objective of the report

The purpose of the report is to analyse the Argyll and Bute Council ICT and Digital Strategy 2017-20 and select the appropriate an ICT framework for it according to the analysis result.

The primary objective of the report is to establish an ICT infrastructure proposal report for the Argyll and Bute Council to deliver services through ICT infrastructure and digital environment. Then considering the deficient aspects of the strategy based on the selected framework and regarding them as key gaps in section 4.2.

Lastly, according to the detailed analysis of the proposals, presenting some recommendations.

### 2.2 The scope and limitations of the analysis

The scope in the report is restricted and contains the content of the Argyll and Bute Council ICT and Digital Strategy 2017-20. The analysis section is based on the ITIL framework and the strategic goals of the Argyll and Bute Council.

The limitations of the analysis primarily include:

- Insufficient uniform management because of the vague internal structure of the Council.
- The proposal would not be very professional since the budget is unknown.

### 2.3 The assumptions

The report assumes that information and current environment provided by the Argyll and Bute Council ICT and Digital Strategy 2017-20 is complete and accurate. In addition, the current environment should not exist the internal conflict between the Argyll and Bute Council and digital technology.

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## 3. ICT Governance Framework

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### 3.1 Existing ICT Governance Framework

In the IT service management section, the Argyll and Bute Council mentioned that the 3rd version of Information Technology Infrastructure Management Library (ITIL) (ITIL V3) is selected to guarantee the IT services are matched with the aim of the Council.

### 3.2 Choice of ICT Governance Framework

Information Technology Infrastructure Library (ITIL) is appropriate to be selected as the ICT Governance Framework since the ITIL demonstrates the detailed IT services management and related practices compared to the COBIT and other well-known frameworks.

The ITIL focuses on the stakeholders, and better manages service quality, availability, reliability, and service costs through a series of detailed criteria. It improves the communications between business units and IT departments, thereby enhancing the efficiency. Thus, the ITIL is suitable to provide the analysis result and plan to the Council since the strategic plan primarily concerns on the IT services.

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## 4. Analysis of the Argyll and Bute Council ICT and Digital Strategy

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### 4.1 Analysis

The analysis section is based on the ITIL criteria to evaluate the Argyll and Bute Council ICT and Digital Strategy 2017-20 and describes the key gaps identified in section 4.2.

ITIL Guidelines/Criteria	Evidence	Assessment / Findings
G1. Financial Management  The Argyll and Bute Council should count the financial expenditure and budget to establish and support sufficient ICT services.	<ul style="list-style-type: none"><li>● “Some of the actions of the ICT and Digital Strategy may result in business cases seeking additional funding where improvements cannot be accommodated fully within the existing ICT Capital Programme.”</li><li>● “It will be very challenging to remove further cost without</li></ul>	The Argyll and Bute Council indicated that they have established a financial management. However, the budget they estimated is too low to support business services and they will encounter the budget challenges based on the current circumstance.

	<p>reducing the ability of the ICT service to continue to support business improvement activity across the Council at the current level.”</p> <ul style="list-style-type: none"> <li>• “Where a positive return is demonstrated, then the savings will be needed to fund the cost of the new developments.”</li> </ul>	<b>(Partially conform)</b>
<p>G2. Service Portfolio Management</p> <p>The Argyll and Bute Council should manage the portfolio of all IT services to ensure that the delivered services correspond to the strategic goals.</p>	No evidence.	<p>The Council does not provide any plans to demonstrate the service portfolio management.</p> <p><b>(Does not conform)</b></p>
<p>G3. Strategy Management for IT Services</p> <p>The Argyll and Bute Council should evaluate the capability of IT services in the market and engage in strategy management, including analysing the market, reviewing current customer demands and planning for potential expansion of market.</p>	No evidence.	<p>The Council does not provide any plans to demonstrate the process of review customers' requirements.</p> <p><b>(Does not conform)</b></p>
<p>G4. Business relationship management</p> <p>The Argyll and Bute Council should create and maintain customer relationships, understand customers' requirements and offer services that satisfy those needs.</p>	No evidence.	<p>The Council does not provide any plans to demonstrate the relationship management about the services provider and customers. Meanwhile, it also does not provide services which satisfies the requirements.</p> <p><b>(Does not conform)</b></p>
<p>G5. Service Level Management</p> <p>The Argyll and Bute Council should measure performance based on the planning and definition of the</p>	<ul style="list-style-type: none"> <li>• “ICT is regularly benchmarked against other Local Authorities via the National and Scottish SOCITM benchmarking services and regularly compares favourably with similar authorities in terms of cost, quality, and the effectiveness of the services</li> </ul>	<p>The Council builds a plan for the service delivery objectives which are used to evaluate the performance. However, it does not illustrate the service level agreement (SLA) which describes the service targets and compares with the actual service</p>

organisation service delivery aims.	<p>delivered"</p> <ul style="list-style-type: none"> <li>• "For overall customer satisfaction, the ABC score ranked 3rd highest of all Scottish participants and ranks in the top 25% of all UK regional and national scores."</li> </ul>	<p>performance.</p> <p><b>(Partially conform)</b></p>
<p>G6. Availability Management</p> <p>The Argyll and Bute Council should ensure that services maintain the circumstance of availability and expandability.</p>	<ul style="list-style-type: none"> <li>• "We will support our workforce in enhancing their skills to take full advantage of existing and new technologies."</li> </ul>	<p>The Council could enhance the availability and expandability to some extents. Nonetheless, the plan is not specific and does not mention for what skills the staff will be trained.</p> <p><b>(Partially conform)</b></p>
<p>G7. Capacity Management</p> <p>The Argyll and Bute Council should maintain the sufficient capacity to support the operations of business requirements.</p>	<p>No evidence.</p>	<p>The Council does not provide any plans to capacity and relevant content. Only the population which the Council serves is known.</p> <p><b>(Does not conform)</b></p>
<p>G8. Continuity Management</p> <p>The Argyll and Bute Council should proceed the risk management to guarantee the continuity of the business.</p>	<ul style="list-style-type: none"> <li>• "A Developing Priorities statement has been produced and published in the Group Asset Management Plan (GAMP) [ICT Capital GAMP November 2016] which describes the condition and risk of our systems, and the improvements the users want to see."</li> </ul>	<p>The Council describes some of technical risks and few risks in the strategic aspect. In addition, it does not establish the detailed risk management and no specific description of the risks attached.</p> <p><b>(Partially conform)</b></p>
<p>G9. Information Security Management</p> <p>The Argyll and Bute Council should detect, restrict, and restraint unauthorised access, improving the level of protection for systems, data, and people using systems and data.</p>	<ul style="list-style-type: none"> <li>• "We will do everything we can to guard against Cyber-attacks and intrusions and we will protect sensitive personal or business information, and prevent disruption to the operations of the Council."</li> </ul>	<p>There is no obvious and detailed information security management (ISM) although the Council reflects and considers some security issues in services.</p> <p><b>(Partially conform)</b></p>
<p>G10. Supplier Management</p> <p>The Argyll and Bute Council should monitor all suppliers and their</p>	<ul style="list-style-type: none"> <li>• "We will enable efficient partner working through digital collaboration and information sharing technologies such as SharePoint and Skype, providing highly secure infrastructure and</li> </ul>	<p>The Council only demonstrates what the cooperation goals with the suppliers but does not provide a supplier management to manage the relationships with suppliers and monitor the</p>

relationships to check whether the participants are in compliance with the contracts and agreements.	communications technologies in our schools and Health and Social Care Integration programmes"	contracts with them.  <b>(Partially conform)</b>
G11. Knowledge Management  The Argyll and Bute Council should train and improve the level of technicians and accumulate useful knowledge for them and their customers to use when solving problems.	<ul style="list-style-type: none"> <li>"We will support our workforce in enhancing their skills to take full advantage of existing and new technologies."</li> </ul>	The management applied by the Council is not specific and does not mention for what skills the staff will be trained.  <b>(Partially conform)</b>

Table1. The table of analysis through ITIL framework.

## 4.2 Identification of Key Gaps

In section 4.2, based on the table with detailed analysis in section 4.1, the key gaps of the Argyll and Bute Council strategic plan are generated and identified. Compared to the ITIL framework, the shortage and missing aspects of the strategic plan could be regarded as the key gaps. Then in next section, proposals are presented in terms of key gaps.

The key gaps:

### **KG1. Lack of Strategy Management for IT Services**

The Argyll and Bute Council does not establish the strategy management for IT services, which stands for that the Council will not guarantee the IT services, analyse the market, verify the demand of the customers and plan for potential market expansion. Without strategy management, the Council will not understand whether the services satisfy the requirements of the customers. For instance, when weighing the pros and cons of the cloud services and the local data centre, if the Council does not process the strategy management to evaluate these two strategic services, it will not know which could provide the better cost-effectiveness.

### **KG2. Lack of Service Level Management.**

The Argyll and Bute Council does not demonstrate the service level management despite the Council designs a plan for the service delivery objectives which are used to evaluate the performance. Meanwhile, since there is no obvious mention of SLA and detailed SLM, the different departments of The Argyll and Bute Council did not reach an agreed service level. Therefore, the quality of the services implemented is difficult to guarantee. Moreover, it is also hard to adjust services level without using SLA and SLM as the guideline when the services need to be improved.

### **KG3. Lack of Continuity Management**

The Argyll and Bute Council demonstrates some risks in technical and strategic aspects. However, it does not establish the comprehensive continuity management to manage the risks and maintain the continuity of business. Furthermore, there is no specific description of the risks attached. Thus, once unexpected events occur, it will have direct negative impacts on the strategic plan and the Council. In addition, as there is no continuity management, it is difficult to process emergency management and business recovery.

#### **KG4. Lack of Supplier Management**

The Argyll and Bute Council set goals to cooperate with suppliers but does not establish the supplier management to manage the relationships with them, which leads to that it is hard for the Council to guarantee the decent relationship with suppliers, and further results in the failure of the services. Finally, it is doubtful for the Council to monitor and maintain the contracts with the suppliers without the supplier management and services are not guaranteed.

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### **5. The Proposal**

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In this section, a proposal, primarily figures out the key gaps identified in section 4.2, is presented for the Argyll and Bute Council and aligns with the Council's service and infrastructure directions. In addition, it also provides an answer to the question '**How does Argyll and Bute ICT and Digital Strategy 2017-2020 indicate awareness of the provision for service, infrastructure transformation and scalability over the life of the strategy?**'

#### **5.1. Proposed Solution**

The proposal is presented through three components:

- Service-Oriented Architectures (SOA)
- Cloud computing
- Mobile app/Mobile development

Although they are described in different aspects of the proposal, they are actually separate in the external and coherent in the internal. Since the services provided by the Council are broad, for different departments of the Council, the system integration become challengeable. Hence, the Council should utilise the SOA to process the architecture transformation. After the transformation, the cloud computing is used to support the digital projects and services to ensure the digital strategy is more safe and convenient and save the cost. Meanwhile, the mobile app uses the cloud services as the platform and the design of the SOA as the carrier to integrate various services for the customers in order to guarantee the app is able to run in different common devices, such as mobile phones and laptops.

#### **5.2. Purpose / Goals of this Proposal**

Based on the result of the analysis in the table in section 4.1 and the summarised key gaps in section 4.2, there exist some shortages in the strategic plan, such as unchecked IT services and insufficient risk management.



The proposal is presented to help the Council improve the quality of the strategic plan and through addressing the key gaps, decrease the shortage of the ICT strategy.

### **5.3. Assumptions Underlying this Proposal**

The proposal assumes that:

- The budget for measures in the proposal is sufficient.
- When using the cloud computing and digital services, the security of the transfer, storage and application of the data must be guaranteed, which is responsible for customers and staff in the Council.

### **5.4. Proposal Description**

#### **5.4.1 SOA**

Currently, services of the Argyll and Bute Council are primarily provided and implemented through traditional manual operations between staff and customers and some web-based mobile operations. Nonetheless, with the development of technology, people always expect to access the information they need from anywhere and anytime. Hence, the requirements for government administration through mobile app increases gradually. Based on the circumstance of customers' expectation, the Council should utilise Service-Oriented Architecture (SOA) to reconstruct the business system. From the definition, Service-Oriented Architecture (SOA) is a design of the software architecture pattern which connects the different functional units (services) of an application through well-defined interfaces and contracts between these services (Erl, 2005). Thus, the SOA framework is able to figure out the challenges from the information sharing and services integration in the internal of the Council. Based on the SOA framework, the Council should utilise the existing IT resources to establish a unified mobile management platform for the Argyll and Bute Council, thereby diminishing the cost of ICT infrastructure. Meanwhile, all the services provided by the Council are implemented on this platform in order to achieve a unified mobile office system for staff and a unified service system for customers.

#### **5.4.2 Cloud computing**

Cloud computing is a pay-as-you-go model that provides usable, convenient, on-demand network access and access to a configurable pool of computing resources (resources including network, server, storage, application software, services), including software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS) (Armbrust et al., 2010). Therefore, the Argyll and Bute Council should abandon the local data centre in the short term, or use the local data centre as a data backup centre, and implement cloud computing services on the existing ICT infrastructure to realise the cross-regional and cross-system coordinates. In addition, the Council will enjoy the benefits of the cloud through the cloud computing, including the 24 hours of uninterrupted operation, the display of the transparent work and decision making procedures.

#### **5.4.3 Mobile app/Mobile development**

In the strategic plan, it mentions that customers hope that the department of the Council can provide a practical and straightforward app for them to use, and hope that the Council will provide services through digital channels (Argyll and

Bute council, 2018). Therefore, the Argyll and Bute Council should develop a cloud-based mobile app, which is based on the design of the SOA framework and integrates all the services provided by the Argyll and Bute Council to run on multiple platforms and multiple devices. However, at the same time, the Council should process Information security management. For instance, for the staff who are outside of the Council location, if they want to do works or use the service, they can connect and transfer data through VPN, which increase the security level of the wireless data channel.

#### **5.5. Alignment of the Proposal with the Council's Service and Infrastructure Directions**

The SOA help the Council finish the architecture transformation. The mobile office not only corresponds to the expectation of the customers and staff in the Council but also aligns with the digital plan in the strategic plan. Moreover, the sharing process of information becomes easier in order to enhance the efficiency and quality of the services and response speed.

The cloud computing decreases the budget of digital services and saves the resources through the cloud services to ensure the 24 hours of uninterrupted operation. Meanwhile, the old local data centre is also utilised reasonably.

The mobile app/mobile development is the channel to implement the digital services which satisfy the requirement of the customers and staff in the Council.

#### **5.6. How the Proposal Addresses the Key Gaps**

For KG1, through the SOA, the Argyll and Bute Council is able to check the IT service, evaluate services whether they satisfy the customer's demand and thus adopts better solutions to improve the service. For KG2, through the SOA, different departments of the Argyll and Bute Council could achieve a consistent level of service and guarantee the quality of the services implemented. For KG3, through the SOA, Cloud computing and Mobile app, the Argyll and Bute Council can decrease not only technical but business risks and process continuity management. For KG4, through the SOA, the Argyll and Bute Council can monitor the relationship between the various suppliers and promote the different parties to achieve the goal together.

#### **5.7. Alignment of the Proposal with the Chosen ICT Governance Framework**

First, the use of SOA and Cloud computing allows the Council to have a shared platform with sufficient space and not pay attention to the capacity, which corresponds to the capacity management of the ITIL framework (Brewster et al., 2012). Second, Cloud computing-based deployments protect the security and stability of data transfer, storage, and usage, which is consistent with the information security management of the ITIL framework (Brewster et al., 2012). Lastly, the Mobile app enables customers and staff in the Council to use the various services provided by the Council, which aligns with the service directory management of the ITIL framework (Brewster et al., 2012).

#### **5.8. Expected Outcomes of Proposed Solution**

The “Digital Transformation” and “Digital Priority” plans are able to be implemented after Cloud computing and app development, which allows customers and staff in the Council to enjoy public services through digital channels.

In the short term, the digital services platform of the Council will transit from the local data centre to cloud service, which improves the security level and data stability and increasing cost-effectiveness.

All IT services provided by the Council are evaluated, and different departments achieve a consistent level of service, and the quality of service is guaranteed.

Risks were assessed, and comprehensive continuity management was conducted. The relationship between Suppliers is more apparent, and the contract is also under the monitor. Hence, the respective division of work for each role is better defined.

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## 6. Recommendations

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### Recommendation

It is recommended that the Argyll and Bute Council requires to reconstruct the architecture to the SOA gradually.

### Justification:

Today's technology is rapidly developed, and the methods of people's demand on services are continuously changing, and the Council requires to understand the trend. Moreover, SOA is valuable for businesses and government agencies which need to use information technology to solve critical business problems. SOA also provides various supports to promote greater interoperability and portability between applications. Today's service-driven enterprises and government agencies are experiencing the high efficiency of development, the high reliability of services and the high quality of services to maximize the benefits of business opportunities. The Council should also follow in their footsteps.

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## 7. References

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