# Literature Review Outline

Topic: Application of microservices architecture in the development of web applications using the Banking and Financial Services Industry as an example

**Introduction (250 words)**

- Introduce the purpose and layout of the literature review
- Define the topic and provide context as to what a microservices architecture is
- Highlight importance and reasoning for current growth in adaptation and relevance in industry

**Monolithic versus Microservices Architecture (500 words)**

This section will provide an outline and current knowledge of the challenges and advantages of both a more traditional monolithic and a microservices architecture, while highlighting key differences.

- Brief description of monolithic architecture (interconnected modules in a single, self-contained unit)
- Highlight key constraints of traditional Monolithic approach:
    - **Deployment rigidity:** forced to redeploy whole application whenever a new feature or change needs to be tested (compiles into one block of code)
    - **Scalability:** individual modules cannot be rescaled to suit user demands. Instead, the whole application needs to be rescaled, resulting in non-efficient use of money and resources
    - **Integration Flexibility:** incorporating new features and services (e.g., from external vendors) cannot be done seamlessly without effecting the whole application.

- Explain the key differences that a microservices architecture offers to overcome these constraints:
    - **Modular approach:** services are offered as individual, stand-alone blocks of codes that can run on separate servers
    - **API-based communication:** use of API endpoints to communicate between services and transmit data to enable a flexible structure that can be easily extended or replaced

- What are the downsides of migrating to a microservices structure?
- Use in modern technology and market scope

**Application of Microservices Architecture for the Banking and Financial Services Industry (500 words)**

This section aims to describe the current architectural landscape within the banking and financial services industry, highlight any challenges with the introduction and application of microservices within it, as well as discuss opportunities where such an architecture especially makes sense.

- Current legacy systems used in banking (mainframes, backbones of banking backend infrastructure, mostly monolithic)
- Challenges of migrating legacy systems to a microservices infrastructure
- Shift towards digitisation within industry over past several years to meet consumer expectations and becoming more customer-centric
- E-Banking as a prime example of where microservices could be applied very well

**Practical Implementation of a Microservices Architecture (500 words)**

This section will provide an outline of strategies and methodologies to practically implement a microservices architecture and specific tools that can be used to decrease time-to-market and keep required resources to a minimum while ensuring a stable migration.

- Overview of current methodologies and infrastructure used within a microservices setup
- Discussion of Containers and Virtualisation
- **Docker:** OS-level virtualisation to deliver software in packages called containers and ensure compatibility across different machines and environments
- **Kubernetes:** container orchestration tool to manage a multitude of containers running on pods (smallest unit within Kubernetes system) and ensuring scalability of the management of such a fragmented application
- Highlight benefits, as well as disadvantages towards this form of integration through highlighting relevant literature

**Conclusion (250 words)**

- Summarise important aspects and main takeaways
- Evaluate the current state of the literature reviewed
- Identify significant flaws or gaps in existing knowledge
- Outline future areas of studies where additional research might make sense