# A Comprehensive Review
# of Information Technology Strategy Components
# in Higher Education Institutions

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*Abstract—* **Higher education institutions, as supporters of human resource development, must keep pace with rapid technological advancements to achieve relevance. One crucial step is to formulate an Information Technology (IT) strategy that aligns with the current era. However, creating this strategy faces challenges due to a lack of explicit guidelines concerning IT strategy components, which can impede the process. Therefore, a Systematic Literature Review (SLR) is conducted in this research to identify commonly found components in IT strategy documents. A total of 32 IT strategy documents from the period between 2015 and 2023 were analyzed. Through this SLR, six consistent components were identified in Higher Education IT Strategy documents is Strategic Priorities, Vision and Mission, Governance, Executive Summary, Implementation, and Digital Service.**

*Keywords— IT Strategy, Components, Higher Education, Systematic Literature Review*

## I. INTRODUCTION

In building and operating business processes within a company, strategic planning for Information Technology (IT) is necessary to support the business strategy. Similarly, Higher Education Institutions require an IT Strategy. Strategic planning serves as the initial step and a strong foundation for ensuring the smooth operation of an organizational business process.

According to the Cambridge Dictionary, "Strategy is a detailed plan for achieving success in situations such as war, politics, business, industry, or sport, or the skill of planning for such situations" Meanwhile, the Oxford Dictionary defines strategy as "a plan intended to achieve a particular purpose." Therefore, strategy can be defined as a plan to achieve specific long-term goals. In general, the concept of strategy can be summarized as the ideal future state of an organization, mapping out the path or means to achieve it, and communicating it to the organization.

However, an Information Technology and Systems (IT/IS) strategy is focused on establishing a vision for how technology can support meeting an organization's business needs (As you can see in Fig 1) . Therefore, an IT strategy can also be defined as an approach to creating maximum and sustainable information technology capabilities for an organization.

One model an organization or company can use to design strategic planning in the IT field is the IT/IS Strategic Planning Model, which outlines the relationship between business and IS/IT strategy (As you can see in Fig 2).
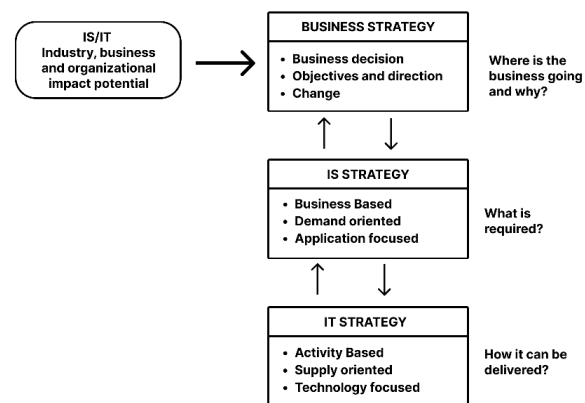


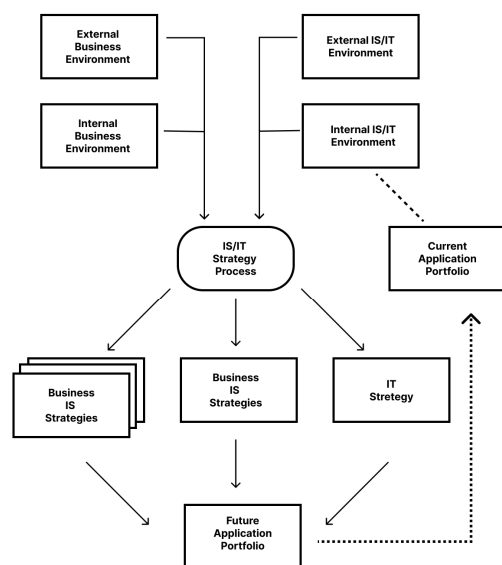Fig. 1.   Model for formulating IS/IT Strategy [1].



Fig. 2.   The relationship between business and IS/IT Strategy [1].

IT strategy is crucial and necessary for any business entity. The frequency of service requirements within organizations is increasing. IT performance has now become a determining factor, rather than a mere support, in achieving organizational goals. With an IT strategy, the vision and mission can align with the organization's objectives, enabling all parts of the organization to understand common goals and how to achieve them. With an IT strategy, business processes become faster, shorter, more extensive, easier, and more innovative.

An IT strategy helps companies become more focused and competitive while minimizing potential issues. Without an IT strategy, a company is like a vehicle without a steering wheel and direction. It means a company with an IT strategy must know its targets and be more knowledgeable and adrift in the 21st-century market. A well-defined IT strategy can ensure good results and meet challenges and market competition, ultimately leading to sustainable profitability. Based on the reason, we have conducted qualitative research to obtain information about the components that constitute an IT strategy. This research will serve as a guide for higher education institutions in formulating their IT strategies. Higher education institutions must consider the relevant IT components aligned with the company's business processes when formulating an IT strategy.

However, it is undeniable that there are challenges in formulating an IT strategy due to the need for standardized rules regarding the components of an IT strategy. As [2] stated, there needs to be more explanation regarding the components of an IT strategy, resulting in a lack of definitive guidelines for organizations in designing their IT strategies. It is not surprising that there are no standardized instruments for the components of an IT strategy because business activities are dynamic and constantly evolving, subject to organizational needs and technological advancements. Nevertheless, companies can seek references for components that align with their business processes and vision by examining documents from similar companies operating in the same field and within a recent timeframe.

In the effort to formulate an effective IT strategy for higher education institutions, several challenges need to be addressed. One of the main challenges is the need for standardized rules and regulations concerning the components of an IT strategy. As elucidated by [2], there is currently a significant lack of comprehensive explanations regarding the specific components that should be present in an IT strategy. This deficiency results in a lack of concrete guidelines for educational institutions when designing their IT strategies. It is natural in a dynamic and constantly evolving educational environment that there is no universally applied standard instrument for the components of IT strategy in higher education. Therefore, the purpose of this research is to address this gap by identifying the components that emerge from Higher Education IT Strategy documents and determining which components appear most frequently. Through this approach, the study aims to provide commonly occurring components that can serve as a guide for crafting IT strategies.

## II. RESEARCH METHOD

The methods used to select Higher Education IT Strategy documents in this research were a systematic literature review. Based on the Kitchenham framework, this Systematic Literature Review (SLR) study follows the stages of planning, implementation, and reporting [3]. It commences by establishing the primary objective of this research, which is to discern the trends in the utilization of components in IT Strategy Documents within higher education institutions.
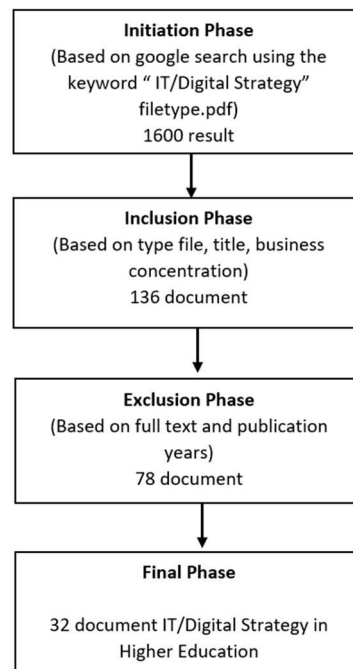


Fig. 3. The selection phase of the final document

The subsequent step involves establishing the review protocol, encompassing criteria, research inquiries, year ranges, types, and sources of literature. The research inquiries are formulated employing the PICOC formula (Population, Intervention, Comparison, Outcome, and Context). Following that, the next phase encompasses determining inclusion and exclusion criteria, along with a checklist for assessing the literature's quality.

TABLE I.        PICOC FORMULA.

| Subject | Description |
|---|---|
| Population | IT Strategy Document at Higher Education Institutions |
| Intervention | Components comprising the document" |
| Comparison | - |
| Outcomes | Trends |
| Context | Studies in Academia |

Utilizing the PICOC framework, the subsequent research inquiries are structured:
1. RQ1: What are the components found in the Higher Education IT Strategy document?
2. RQ2: What are the most commonly appearing components in Higher Education IT Strategy documents?

Literature Search and Collection involve systematically searching for and gathering IT Strategy documents by applying a systematic literature search procedure. The documents used are IT Strategy documents in Higher Education obtained through a Google Search using the keyword "IT Strategy" filetype: pdf. The next phase involves the selection of Higher Education IT Strategy documents based on inclusion and exclusion criteria related to document types and institutions. The guidelines for determining who

will be included and excluded in this study are based on the research questions and guidelines outlined by Kitchenham. The methodology approach used in the Systematic Literature Review (SLR), following Kitchenham's methodology, has been employed by other researchers as well. In a study conducted by [4], the Kitchenham framework was utilized. The purpose of employing the Kitchenham framework in this research is to identify various issues that arise and to present both technical and non-technical solution options to address these problems.

Education IT Strategy documents are made gradually to choose documents relevant to the analysis needs. Therefore, the selection process is conducted in the following stages: Reading the document titles; classifying the documents according to field or business concentration, author names, and publication years; creating a list of IT Strategy components in a table; providing a checklist to facilitate reading the table; and comparing each IT Strategy component from each document.

The final step is to systematically analyze the literature by identifying each component of the Higher Education IT Strategy that has been collected and assessing the alignment and modal value of the components reflected in the cross-temporal IT Strategy documents. Additionally, concluding the research results regarding the most frequently used and still relevant IT Strategy components.

TABLE II. SUMMARY OF IT STRATEGY THEMES IN HIGHER EDUCATION INSTITUTIONS

| No. | University/ Collage | Country | Year | ES | VM | PR | CS | SP | DS | OKP | RM | GO | GC | IN | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | University of Newcastle [5] | Callaghan, Australia | 2021-2025 | X | X | | X | X | | | | X | | X | 6 |
| 2 | University of Wolverhampton [6] | Wolverhampton, UK | 2021-2025 | X | X | | X | X | | | | | X | X | 6 |
| 3 | University of Nottingham [7] | Nottingham, UK | 2021-2025 | X | | | | X | | X | X | | X | X | 6 |
| 4 | Aberystwyth University [8] | Wales, UK | 2021-2025 | X | X | X | | X | X | X | | | | | 6 |
| 5 | University of Ottawa [9] | Ontario, Canada | 2020-2025 | X | X | | | X | | | | X | | | 4 |
| 6 | Edinburgh College [10] | Edinburgh, UK | 2020-2025 | X | | | | X | X | X | | X | X | | 5 |
| 7 | University of Georgia [11] | Georgia, USA | 2020-2025 | | X | | | | | X | | X | | | 3 |
| 8 | Ulster University [12] | Coleraine, Ireland | 2020-2023 | X | | | | X | X | | | | | X | 4 |
| 9 | Auburn University[13] | Alabama, USA | 2019-2024 | X | X | | | X | | | | X | X | | 5 |
| 10 | York University [14] | Toronto, Canada | 2019-2024 | | X | | | X | X | | | X | | | 4 |
| 11 | Athabasca University [15] | Alberta, Canada | 2018-2022 | | X | X | | X | | | | X | | | 4 |
| 12 | University of Auckland [16] | Auckland, New Zealand | 2018-2020 | X | | X | X | X | X | | | | X | | 6 |
| 13 | University of Cincinnati [17] | Ohio, USA | 2017-2020 | X | | | X | X | | | | X | | X | 5 |
| 14 | University of Leicester [18] | Leicester, UK | 2016-2020 | | | | | X | X | | | X | | | 3 |
| 15 | Humber College [19] | Orangeville, Canada | 2015-2019 | | X | | | X | | | | X | | | 3 |
| 16 | University of South Australia [20] | Adelaide, Australia | 2015-2020 | X | X | | | X | | X | | X | | | 5 |
| 17 | La Trobe University [21] | Melbourne, Australia | 2015-2017 | | | | | X | | | | X | | | 2 |
| 18 | Boston College [22] | Massachusetts, USA | 2015-2017 | X | X | | | X | X | | | X | | | 5 |
| 19 | University of Oswego [23] | New York, USA | 2017-2018 | X | X | X | X | X | X | | X | X | X | X | 10 |
| 20 | St Cloud State University [24] | Minnesota, USA | 2018 | | X | | X | X | | | X | X | X | X | 7 |
| 21 | University of Mary Washington [25] | Virginia, USA | 2015-2020 | X | | | X | X | | | | X | | X | 5 |
| 22 | University Nebraska Omaha [26] | Nebraska, USA | 2017 | | | | | X | | | | X | | | 2 |
| 23 | Seneca College [27] | Toronto, Canada | 2018-2021 | | X | X | X | X | X | | | X | | X | 7 |
| 24 | Wilfrid Laurier University [28] | Waterloo, Canada | 2021-2022 | | X | X | X | X | X | X | | X | | X | 8 |
| 25 | McGill University [29] | Montreal, Canada | 2020-2025 | X | X | X | | X | X | | X | | X | | 7 |
| 26 | West College Scotland [30] | Clydebank, UK | 2016-2020 | | X | | X | X | | | X | X | | X | 6 |
| 27 | Dudley College[31] | Dudley, UK | 2020-2023 | X | | | X | X | X | X | X | | X | X | 9 |
| 28 | Fashion Institute of Technology [32] | New York City, USA | 2018-2020 | | X | X | | X | X | | X | X | | | 6 |
| 29 | University of Birmingham [33] | Birmingham, UK | 2023 | | X | X | | X | | | | | | X | 4 |
| 30 | Durham University [34] | Durham, UK | 2020-2027 | X | X | X | X | X | X | X | X | X | X | X | 11 |
| 31 | University of Gloucestershire [35] | Cheltenham, UK | 2022-2027 | | X | | | X | X | X | | X | X | X | 8 |
| 32 | University of Portsmouth [36] | Portsmouth, UK | 2021-2025 | X | X | X | | | | | X | | | X | 5 |

SP = Strategic Priorities, VM = Vision and Mission, GO = Goals and Objective, ES = Executive Summary, IN = Implementation, DS = Digital Strategy, PR = Principles, GC = Governance, CS = Communities, RM = Risk Management, OKP = Outcomes and Key Performances

## III. RESULT AND DISCUSSION

Based on the search results of literature studies from documents on IT Strategy, several documents from various Higher Education institutions were obtained and are presented in Table 1.
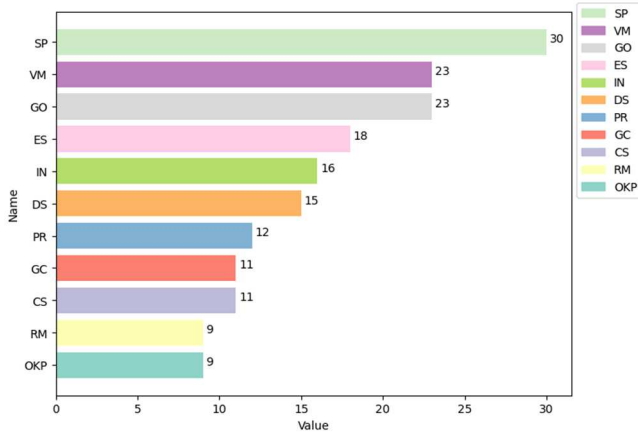


Fig. 4. Distributed Component IT Strategy

After we find the IT Strategy from any university and a distributed value of the component, the next step is to answer the research questions that are the objectives of this study.

### A. What are the components included in the Higher Education IT Strategy documents?

From the 32 IT Strategy documents of Higher Education institutions, the following components can be gathered: Executive Summary, Vision and Mission, Principles, Communities, Strategic Priorities, Digital Service, Outcomes and Key Performance, Risk Management, Goal and Objectives, Governance, and Implementation.

**Executive Summary**. An executive Summary is created by executives and presented at the beginning of a document or report. Executive Summaries are often used in project proposals, annual reports, business plans, or stakeholder presentations. The primary purpose of creating an executive summary is to provide a brief overview of the entire document, including objectives, methods, findings, recommendations, and conclusions found in the main document.

**Vision and Mission**. Vision and mission should be included in a document because they provide the direction and goals to be achieved. The Vision component is a long-term description of the organization's desired future, a prominent and inspirational goal. The Mission component focuses on the activities and values adopted to achieve the mission, and it is created as a way and guide to accomplish organizational objectives.

**Principles**. This component contains the guiding principles in a document that serves as guidelines or ideals depending on the document's context and purpose.

**Communities**. This component contains or refers to communities where the content of this section includes information related to data, descriptions, or analyses regarding the identity and characteristics, social structure, activities and events, issues and challenges, as well as the potential and opportunities of the community.

**Strategic Priorities**. In the context of IT Strategy documents, Strategic Priorities refer to the main goals or focus set to make achieving an organization Vision and Mission easier. things often discussed in strategic priorities include specific goals related to vision and mission, strategic initiatives, reasons for selecting priorities, risk assessment, performance measurement, and the resources needed.

**Digital Service**. In the context of an IT Strategy document, the Digital Services component includes the digital means that a company will utilize to achieve its goals in implementing the IT Strategy. Some examples of digital services include application and software development, digital payment systems, cloud services, and digital security.

**Outcomes and Key Performance**. In the context of an IT strategy document, Outcomes and Key Performance Indicators (KPIs) are used to measure the success of the planning outlined in the document. Outcomes refer to the goals achieved through efforts or activities, usually related to the desired changes in a particular condition or situation. On the other hand, KPIs are indicators, metrics, or parameters used to measure a company's or organization's success or performance.

**Risk Management**. In implementing IT Strategy, Risk Management is used to prevent problems, challenges, or risks that could hinder the achievement of the company's strategy and goals. It aims to identify, assess, and mitigate potential risks to ensure the smooth execution of the IT Strategy. Risk Management is an activity that involves documentation. In implementing IT Strategy, Risk Management is used to prevent problems, challenges, or risks that could hinder the achievement of the company's strategy and goals. It aims to identify, assess, and mitigate potential risks to ensure the smooth execution of the IT Strategy.

**Goals and Objectives**. In an IT strategy document, Goals and Objectives specify what is to be achieved or obtained in implementing a particular activity, project, or initiative. They aim to provide direction and focus to the efforts undertaken and help measure the success and progress achieved. Goals and Objectives serve as guiding principles and criteria for decision-making and resource allocation, ensuring alignment with the desired outcomes and facilitating monitoring and evaluation of the overall performance.

**Governance**. In the context of an IT strategy document, governance is essential for decision-making, granting authority, and establishing regulations that guide and control the entity within a company. When applied to a document, governance refers to the framework that ensures proper document management throughout its lifecycle, including creation, utilization, and maintenance. It involves defining roles and responsibilities, establishing processes and procedures, and ensuring compliance with relevant policies and standards. Effective governance ensures the document is managed efficiently, accurately, and aligned with organizational goals and requirements.

**Implementation**. In the context of a document of IT strategy, implementation is a crucial step required to realize a strategy and turn it into a tangible reality. Implementation involves a series of concrete actions and steps to ensure a carefully designed and planned strategy can be successfully executed. It includes activities such as resource allocation, task assignment, timeline establishment, monitoring progress, and making necessary adjustments. Effective

implementation ensures that the strategic objectives and initiatives outlined in the document are put into practice and achieve the desired outcomes.

However, only some of the documents cover all these components comprehensively. A clear trend of change and development in the components can be observed in the year of publication of the IT Strategy documents. As the year progresses, the number of components included in the IT Strategy documents tends to increase Table 1 Column n.

### B. What components often appear in Higher Education IT strategy documents?

From the checklist in Table 1, we can see that there are components that frequently appear, up to components that rarely appear. The most frequently appearing components from the first to the last order are Strategic Priorities, Vision and Mission, Goals and Objectives, Executive Summary, Implementation, Digital Service, Principles, Governance, Communities, Risk Management, Outcomes and Key Performance Indicators. Therefore, the components that appear most frequently in the IT Strategy document are **Strategic Priorities, Vision and Mission, Governance, Executive Summary, Implementation, and Digital Service.**

Based on the finding, we argue that these six components are essential to be included in IT Strategy documents. *Strategic Priorities* component presents the main strategies that their respective institutions believe can bring strategic benefits based on the institutions' contexts and needs. *Executive* Summary component presents a brief overview to readers to help them understand the overall IT Strategies. Vision and Mission component gives a context of what the institutions aim to achieve and their main activities. Governance is used by companies to manage and direct the use of information technology (IT). the Digital Service component presents the IT-related solutions (e.g., artificial intelligence, cloud computing, mobile learning, etc.) that the institutions apply to carrying out their IT Strategies Lastly, Implementation is used to ensure that this IT strategy is implemented according to the rules and vision of the existing higher education institution.

The other components, such as Risk Management, Objective Key Results, and others, are less frequently included in IT Strategy documents. We have two arguments for this. First, the exclusion is because most of the documents we have collected are openly available online for external communication with the public. Thus, some components can be overelaborated if included in public IT Strategy documents. Second, the components are gradually recognized as essential and are only included more frequently in recent year documents. More work needs to be done to conclude which argument is more dominant over the other.

### C. Benefits and Next Steps for the University

The benefits for a university of the six most prominent components, namely Strategic Priorities, Goal and Objective, Executive Summary, Vision and Mission, and Digital Service, are that this IT Strategy will be related to how the business needs information and systems can be met by technology and provide advantages such as enhancing accessibility and flexibility of education, increasing student engagement, administrative efficiency, creating a conducive

and futuristic learning environment, and assisting educators or researchers in their work and goals, thereby elevating the university's ranking.

The next steps involve implementing the IT Strategy using six key components, recording changes and growth after the utilization of this strategy, followed by evaluating components that have a negative impact and continually developing components that have a positive impact.

## IV. CONCLUSION

The components of IT Strategy play a crucial role in developing IT Strategy documents across all industries, including Higher Education institutions. Based on the literature review of the components in IT Strategy documents within Higher Education institutions, the following conclusions can be drawn:

1. Even though they are engaged in the same field, namely Higher Education, each IT Strategy document has different components.
2. The components obtained from the search are Executive Summary, Vision and Mission, Principles, Communities, Strategic Priorities, Digital Service, Outcomes and Key Performance, Risk Management, Goals and Objectives, Governance, and Implementation.
3. The most frequently appearing components in Higher Education IT Strategy documents are Strategic Priorities, Goals and Objectives, Executive Summary, Vision and Mission, Implementation, and Digital Service.

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