Presenting an Information and Communication Technology Management Capability Model for Universities Based on ITIL V4

Fatemeh Alirezaei Sarvomontani[1,*], Seyed Reza Khayam[1], Rasoul Esmaeili Fard[2]

[1] Department of Organizational Architecture, Faculty of Computer Engineering and Information Technology, Shiraz University of Technology, Shiraz, Iran; alirezaei.nilofar@gmail.com; khayami@sutech.ac.ir.

[2] Department of Computer Engineering and Information Technology, Shiraz University of Technology, Shiraz, Iran; esmaeliy@sutech.ac.ir.

Citation:

Abstract

Today, most organizations face a more dynamic environment than in the past. Consequently, to maintain agility and competitive advantage, organizations must adapt to changes. The first and most crucial step in adapting to changes is for the organization to understand what capabilities it has and what it can do. Business capabilities define a high-level view of the business, focusing on what the organization does or must do to achieve its short-term and long-term goals. The Information Technology Infrastructure Library (ITIL) V4-based capability model provides a comprehensive approach for organizational transformation, change, and capability development to achieve the organization's vision and mission. In this model, first the organization's vision is examined, followed by an assessment of existing capabilities and their maturity levels. Then, based on the organization's long-term and short-term goals, desired capabilities, and their maturity levels are identified, and actions for transitioning from the current to the desired state are proposed within specific timeframes. This model evaluates organizational capabilities across four dimensions: 1) Processes, 2) structure and Human Resources (HRs), 3) tools and technology, and 4) intelligence. Organizational structure is among the factors that affect various aspects of an organization and, therefore, must be considered when implementing Information Technology (IT) governance. IT organizational charts are valuable tools that organizations typically use to display the chain of command for IT personnel. IT units use this visual governance to align resources with the organization's overall objectives. To implement this plan, employees from the Chief Information Officer to IT support staff must understand their organizational roles and how their tasks and responsibilities relate to those of their colleagues. ITIL V4 is considered one of the most comprehensive frameworks with superior expertise in IT, serving as a guiding framework for IT managers in managing and optimizing IT infrastructure. It enables them to ensure the quality of services provided and acquire the necessary infrastructure according to predefined plans. IT management is the process through which all IT resources are managed according to organizational priorities and needs. These resources include tangible assets like networks, computers, and data equipment, as well as intangible assets like software and big data.

Keywords: Information technology, Capability, Organizational structure, Information technology governance, Information technology infrastructure library V4, Control objectives for information and related technologies.

1 | Introduction

Many organizations are facing a more dynamic environment than in the past. On the other hand, given the importance of knowledge in universities and the connection of all units in the university with the information and communication center, this department is one of the sensitive and vital units in the university. As a result,

the organization must adapt to change in order to maintain its agility and competitive advantage. To adapt to these changes and make faster decisions, the organization must know "What" it has and "What work" will bring it the most value. In a simple definition, the work that the organization does to create value for its customers and stakeholders is called "Capability". The information department can be the strategic, organized, and directional arm of the organization, knowing its responsibilities in achieving the organization's goals, and its personnel from the top to the last are well acquainted with their roles and duties. The best example of this communication chain is the organizational structure. A less-considered issue is the organizational structure of a company or organization, which plays an essential role in the formation of group cooperation, personnel responsibility, program transparency, more accurate programs, sources of interpretation, etc. Therefore, the organizational definition of the Information Technology (IT) unit should be based on successful foundations and models. The university environment is changing due to innovations in education and the non-face-to-face nature of some classes, and the organization is looking for organizational and transformation plans to coordinate with changes and not lag behind competitors. Organizational transformation plans in the organization talk about the people within the organization and how they work. This also speaks about planned changes that lead to encouraging individuals, groups, and organizations to perform better. Organizational transformation provides guidelines for improvement, adaptation, and adjustment between individuals and the organization, between the organization and its environment, and between organizational elements and components such as strategy, structure, and processes. These guidelines are implemented by making changes in the organization's programs and activities with the aim of solving problems in specific situations and bringing the organization to its vision and mission. IT is an integral part of business, and its governance is an integral part of organizational management. Hence, to implement and implement governance, review the successful experiences of Information Technology Infrastructure Library (ITIL) V4 testing, the requirements and requirements in IT governance, roles and responsibilities must be clearly defined. Organizational structure is made up of various factors that play a supporting role in various organizations and, hence, is considered when implementing IT governance. They know their relationship and responsibilities with the tasks and responsibilities of other colleagues [1]. Organizational structure can perform the functions of a society's organization and hence becomes an integral part of the puzzle of building and maintaining an organization. Properly shaping the Human Resource (HR) structure of the IT unit, as a strategic assistant to business managers, is very important, and it is crucial that there is not much attention paid to this issue, and even in research studies, there is very little in this area.

Today's organizations consider IT to be one of the essential organizational functions. The adoption and use of IT is one of the most critical factors in information systems research. A significant problem that organizations face in this field is the increasing challenge of implementing and fully supporting the functions and tasks of IT in the organization.

2 | Information Technology Governance in Organizations

Senior management of the technology organization understands the significant role that information can play in the success of organizations. Some managers know how to use IT-based methods and may achieve success in it. Therefore, managers and executives need to increase the management and supervision of IT to ensure that the IT organization follows and does follow the strategies and goals of the organization. From this perspective, IT governance is considered an integral part of the management of the organization. This article aims to introduce IT governance and its planning and familiarize users with the ways to implement it to help managers in applying IT governance in organizations. IT governance is a term used to describe how people consider IT in managing, monitoring, controlling, and leading an entity [2].

IT governance is an integral part of the management of an organization, including the leadership and organization of structures and processes, so that IT can support the goals and plans of the organization and develop them.

Governance is focused on five primary levels in the organization. Two of the five main levels are outputs, which are:

I. Value transfer: On optimizing IT spending and creating IT value. Value transfer refers to the credibility that the organization gains from the use of IT information.

II. Risk management: On information assets, improving errors and non-compliance, and technology continuity and sustainability of operations. Three of the five main levels are the drivers that are required to achieve the outcomes.

III. Strategy setting and alignment: Using a strategic approach to align IT with business solutions.

IV. Resource management: Improving technology knowledge and infrastructure.

V. Evaluation and performance: Tracking project outputs (What is delivered) and monitoring IT service information.

None of the first four factors can be managed well without the evaluation and performance measurement factor [3].

3 | Capability

Capability is used in many different ways, and its definition varies depending on the use case. For example, when we need to communicate between different types of stakeholders (Business leaders, enterprise architects, and program managers), the definition of a capability should be as simple as possible so that it is understandable to all stakeholders:

A capability is a specific talent or ability that an organization possesses and through which the talent can achieve a specific goal or outcome.

Or, in another definition, a capability can be:

A combination of resources, competencies, information, and processes of an organization that creates value for stakeholders. Capabilities provide a high-level definition of what an organization can do [4].

As a result, the definition of a capability can become more detailed and complex depending on the needs of the organization.

4 | Control Objectives for Information and Related Technologies Framework

After introducing IT governance in the organization and the concept of capability, to start implementing IT governance, in order to determine the status of the organization, it is an effective method to use the relevant checklists that consider the five factors mentioned. Then, using the SWOT method, the organization's strategies were analyzed. For the complete implementation of IT governance, there are various standards such as Cadbury, Control Objectives for Information and Related Technologies (COBIT), Turnbull, among which, COBIT, which was prepared by the Governance IT Institute and is internationally accepted as a good model for controlling information, IT and related risks, has been selected for the implementation and audit of IT governance [3]. The main goal of the COBIT project is to develop clear policies and appropriate models for IT security and control, for global approval by specialized, government, and commercial organizations. The goal of COBIT is to meet business objectives [3]. COBIT is a model for IT governance. The basic concept of the COBIT framework is that control over IT is established by considering that information should support business objectives or requirements. The COBIT framework is considered at three levels: At the lowest level, some activities and tasks are required to achieve measurable results. Activities have a life cycle while tasks are more discrete. Then, processes are defined at a higher layer as a set of activities and tasks.

At the highest level, which is most relevant to COBIT, processes are collected in a domain.

Therefore, the COBIT framework can be conceptually considered in three dimensions:

    I.   Information standards

   II.   IT resources

 III.   IT processes

The four broad domains considered in COBIT are:

Planning and organizing, creating and implementing, delivering and supporting, monitoring. Thus, in the planning and organizing domain, strategy and tactics, and concerns related to identifying IT can be collected to achieve business objectives best. In the area of creation and implementation, to understand and create an IT strategy, capabilities must be identified, developed, or created. In the area of delivery and support, timely delivery and provision of required services are considered, and the required support processes must be set up. In the area of monitoring, all IT processes must be regularly assessed for quality and compliance with control requirements.

5 | Proposed Organizational Chart Based on Information Technology Infrastructure Library V4 Framework

Technology has advanced significantly over time, and emerging approaches and phenomena over the years have led to remarkable transformations in the business environment. The current era is one of readiness, flexibility, and adaptability to new methods. Organizations and companies that fail to understand these new conditions face inevitable failure. This is why ITIL V4 has been introduced to help organizations address challenges that not only affect ITSM professionals but also impact the digital world.

ITIL V4 is fundamentally different from its third version, representing a paradigm shift. The service lifecycle structure that formed the basis of version 3 no longer exists, and even processes, which were key concepts in ITIL V3, no longer exist in their previous form. ITIL V4 has essentially created a new digital operational model.

ITIL V4 is among the most comprehensive frameworks with superior expertise in IT, serving as a guiding framework for IT managers in managing and optimizing IT infrastructure. It enables them to ensure the quality of services provided and acquire the necessary infrastructure according to predefined plans. In developing ITIL V4, efforts were made to leverage the latest experiences of industry experts, companies, and organizations, as well as lessons from other methodologies and frameworks such as Agile, DevOps, etc., to provide a comprehensive and complete model for managing all aspects of modern IT in companies and organizations.

ITIL V4 presents a practical and flexible operational model based on four key elements:

    I.   Guiding principles

   II.   Service Value System (SVS)

 III.   Moving from process to practice

 IV.   Providing a holistic approach to value creation

The SVS is the most critical component of ITIL V4, fostering collaboration in value creation. SVS describes how components and activities within an organization collaborate to create value. Since SVS interacts with other parts of organizations, it forms an ecosystem that explains how organizations adapt in the digital world. At the heart of SVS is the Service Value Chain, a flexible operational model for creating, delivering, and continuously improving services.

The SVS includes six key activities: 1) plan, 2) improve, 3) engage, 4) design and transition, 5) obtain/build, and 6) deliver and support. These can be combined in various ways, enabling organizations to define multiple value streams. The flexibility of SVS allows organizations to respond effectively and efficiently to stakeholder

demands. Defining a holistic approach is central to ITIL V4's service management. Accordingly, four key dimensions critical for successfully facilitating value for customers and stakeholders are described by ITIL V4:

I. Organizations and people: Requires an organization with appropriate structure, responsibilities, authorities, and culture aligned with goals, along with a skilled workforce.

II. Information and technology: Involves information, knowledge, and technologies needed to deliver services that meet stakeholder expectations.

III. Partners and suppliers: Refers to relationships with other businesses involved in designing, deploying, delivering, supporting, and continuously improving services.

IV. Value streams and processes: How different parts of the organization work together in a coordinated and integrated manner to enable value creation through services and products is a key dimension of ITIL V4.

6|Information Technology Management Practices Based on Information Technology Infrastructure Library V4 (2019 Edition)

Based on the latest version of ITIL, which is ITIL V4 2019, these practices are as follows:

Service management practices

– *Change management*
– *Capacity and performance management*
– *Business analysis*
– *Availability management*
– *Problem management*
– *Event monitoring and management*
– *IT and communications asset management*
– *Incident management*
– *Problem management*
– *Service configuration management*
– *Service catalog management*
– *Release management*
– *Service continuity management*
– *Service level management*
– *Service desk*
– *Service design*
– *Service validation and testing*
– *Request fulfillment*

General management practices

– *Information security management*
– *Continual improvement*
– *Architecture management*
– *Change management*
– *Measurement and reporting*
– *Knowledge management*
– *Relationship management*
– *Project management*
– *Portfolio management*

- *Strategy management*
- *Financial management for it services*
- *Risk management*
- *Workforce and deployment management*
- *Supplier management*

Technical management practices

- *Software development and application management*
- *Infrastructure and platform management*
- *Deployment management*

6.1|Proposed Organizational Chart

The question "How should we organize our IT unit?" has become one of the most critical challenges for today's businesses. While ITIL V4 provides extensive details about IT organizational structure, considering the uniqueness of each organization, what ITIL V4 introduces in terms of roles and responsibilities may seem impractical and unrealistic for many organizations and businesses. Therefore, despite the definitions and attention ITIL V4 has given to this subject, managers still face difficulties in efficiently and adequately organizing the IT unit. As a result, many organizations and companies have developed their models and standards. These models, while considering ITIL V4 guidelines, are operational, referable, and usable for most organizations, regardless of their size or whether they are centralized or decentralized.

Companies such as CEC Europe and BAR [5], CLAYRAE [6] are among those that have been active in this regard, with *Fig. 1* and *Fig. 2*, respectively, showing versions of their proposed models.
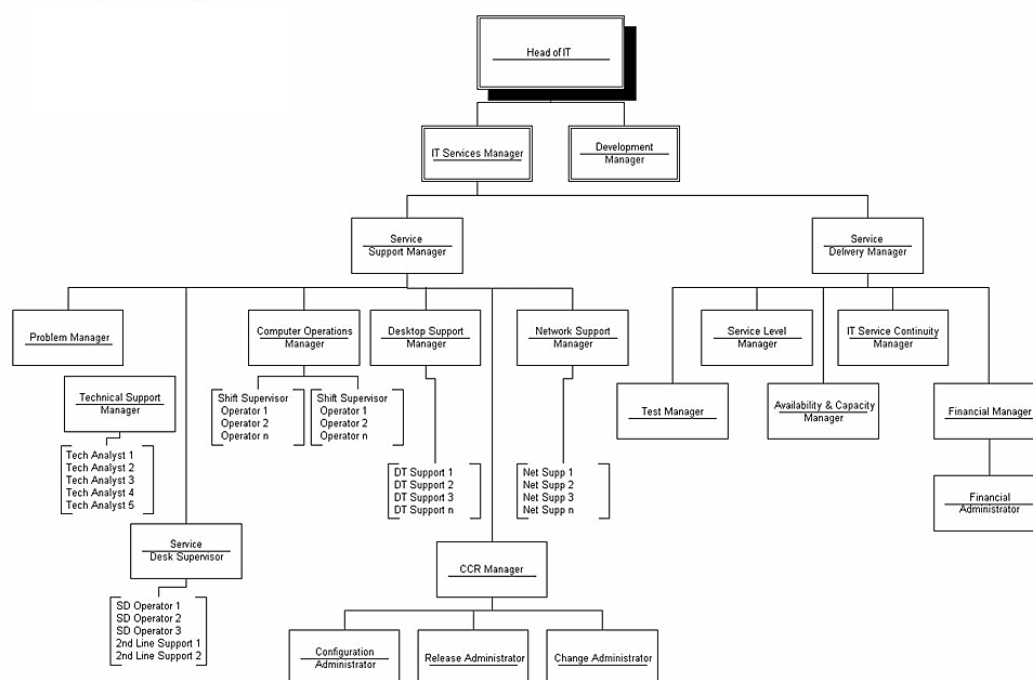

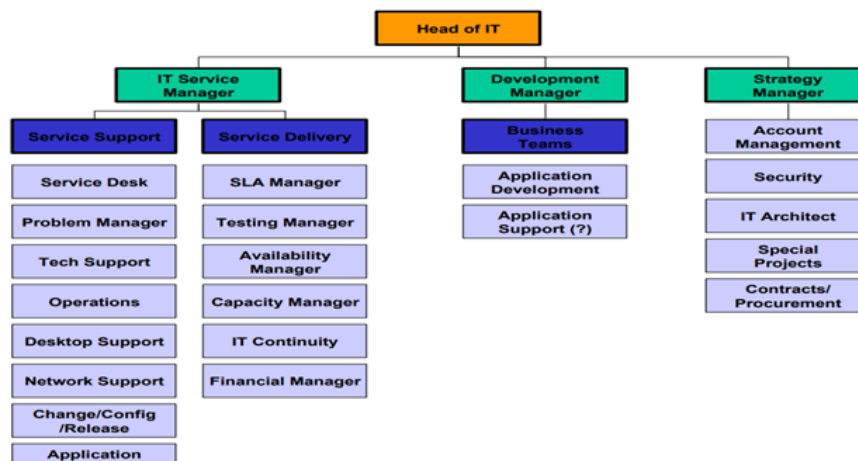**Fig. 1. Proposed organizational chart of the European CEC.**

Fig. 2. Barchayre's proposed organizational chart.

The responsibilities and roles proposed in these models are as follows [7]:

Information technology manager

The head or manager of IT who has direct communication with the senior management structure of the organization. Considerable time and activities are required to accommodate the needs of senior managers or strategic matters. This management includes two subsets:

    I. IT service manager

    II. Development manager

Information technology service manager

Managing IT tasks and personnel, communicating with external customers, computer software and service systems, and computer network connections and users are among the responsibilities of this role. Two management subsets fall under this unit:

    I. Service support manager

    II. Service delivery manager

Service support manager

This role is responsible for all service support activities. Many of these activities have a strong reactive element. Since a relatively large number of personnel are involved in this area, personnel management responsibility in this role is significant. The following roles are proposed under this role:

- *Problem manager*
- *Technical support manager*
- *Service desk manager*
- *Computer operations manager*
- *Desktop support manager*
- *Consumer Credit Regulation (CCR) manager*
- *Network support manager*

Problem manager

Problem control activities include problem analysis and documentation of solutions and known errors. Just like incidents, problems are prioritized based on the risk they pose in terms of probability and impact on services. Attention should be paid to problems that pose the highest risk and danger to services and service management. When analyzing incidents, it is essential to remember that these incidents may have

interdependent causes that could create complex relationships. Therefore, problem analysis should take a comprehensive approach considering all factors that caused the incident, made it worse, or even prolonged it.

When a problem cannot be quickly resolved, finding and documenting a workaround for future incidents based on understanding the related problem can be helpful. A workaround can reduce or eliminate the impact or likelihood of an incident or problem for which there is no complete resolution procedure available.

Problem management in ITIL V4 includes three stages as follows:

    I. Problem identification

   II. Problem control

 III. Error control

This role is responsible for reactive root cause analysis, active trend analysis, and the prevention of problems and incidents. This role can be part-time in small organizations or merged with other roles (Such as capacity management, IT service continuity management). It should be noted that sharing the responsibilities of this role with the service desk manager role is very dangerous and should be avoided to prevent contradictions in goals and scheduling. In large organizations, this role requires extensive support from personnel.

Technical support manager

This role is responsible for technical support and maintenance of central systems (Servers, operating systems, etc.). Team members may be specialists in this field, but ideally, they should have some level of cross-skilling. To some extent, responsibility for capacity and availability should be considered in this role, especially if these roles do not exist independently.

Service desk manager

This role has overall responsibility for the service desk. Organizations with large service desks may need more than one service desk manager to manage personnel and handle the rapid increase in calls. The number of operators needed depends on the nature of incidents, average handling times, and work shift patterns. It should be noted that sometimes in organizational charts, an imbalance is observed between the number of personnel under the service support manager and the number of personnel under the service delivery manager, which can create problems given line management activities (Evaluation, reporting, etc.). Some organizations tend to correct this imbalance and therefore place the service desk under service delivery management. This has advantages, including that the service desk is seen as independent of other support functions and can better represent the customer community's perspective. If the organization has a Customer Relationship Management (CRM) system, it can still be placed under service delivery management, with overall responsibility for the service desk remaining with it.

Service desk operators and second-level support personnel are the first staff to deal with incidents reported to the service desk. Service desk operators, sometimes called service desk analysts, provide first-level support. If an issue cannot be resolved while the customer is on hold and requires more work or more precise knowledge, it is referred to second-level support personnel. In large organizations, this second-level support can be seen as a separate unit with its management and supervision.

Computer operations manager

This role is responsible for all activities such as job scheduling, centralized printing, data and information backup, and batch processing. Depending on the organization's working hours, one to three work shifts can be considered for this role. Typically, there are at least two operators per shift; this number can be increased depending on workload and coverage hours.

Desktop support manager

The actual nature of desktop support varies depending on geographic location and scope of duties. Depending on customer locations, it may be distributed, but it will be deployed through the service desk. Also, depending on the type of activities, such as hardware support, it can be outsourced.

Consumer credit regulation manager

The CCR manager refers to the three areas of change, configuration, and release management. It might seem that in large organizations these three roles should be separate. Still, in reality, the activities of these three groups are so closely related that they should be under a single reporting structure. When a combined CCR management is used in an organization, the high-level aspects required for this role are assigned to one person, while daily activities are delegated to operational staff. In large organizations, a separate team may be needed for each area.

Network support manager

The exact number of personnel and their characteristics in this area depend on the scope and scale of the networks used by the organization and whether they are outsourced or not. Responsibilities regarding network availability and capacity are considered in this role. Therefore, there is a close relationship between this role and the availability and capacity manager under service delivery management.

Service delivery manager

This role is responsible for all service delivery activities, many of which have a strong reactive element or involve longer-term planning roles. The subsets of this role can be organized as follows:

- *Test manager*
- *Service level manager*
- *Capacity and availability manager*
- *IT service continuity manager*
- *Financial manager*

Test manager

One of the needs defined in ITIL V4 is an independent test function. Given the need for independence, the best placement for this function is "Service Delivery" to separate it both from change implementers and from release management. However, in small organizations, this role can be merged with release management.

Service level manager

Management of Service Level Agreements (SLAs) and Operational Level Agreements (OLAs) is performed in this unit, and supplier management responsibility may also be added to this role. Roles such as customer relationship management or audit management can also be defined in this position, with responsibility for reviewing SLAs and service quality feedback.

Capacity and availability manager

These two roles are so closely related that they can be combined or each can be considered an independent role. In small organizations, this responsibility can be merged with IT service continuity responsibilities or problem management, but it is better to keep it under service delivery. ITIL V4 considers keeping the organization updated with new technologies as one of the capacity manager's responsibilities, but in large organizations, the technical architect role can be used for this purpose.

Information technology service continuity manager

This role has overall responsibility for IT service continuity, but ideally should be part of the organization's business continuity team. As mentioned earlier, in small organizations, this role can be merged with availability management or capacity management. It can also be combined with a security role, especially if the organization is seeking security certification.

Financial manager

Overall financial control, including budgeting and IT auditing, is a responsibility of this role. The procurement and purchasing role can also be placed under this management, although this is not necessary in smaller organizations. It should be noted that in some organizations, this role reports directly to the IT manager and also includes overall financial planning and development group management responsibilities.

Development manager

This area is outside the scope of ITIL V4, but if the organization defines a "Transition to live" phase for new IT systems, an independent role will be needed to handle all necessary preparations before system implementation, such as training, familiarization, incident classification, and takeover scripts.

The responsibilities of this role can be divided into two parts:

    I. Application development

    II. Application support

Strategy manager

The purpose of IT service strategy management is to evaluate supplier service proposals, capabilities, competitors, and current and potential market space in order to develop an appropriate strategy for serving customers. After developing such a strategy, the organization still needs this role to ensure strategy implementation.

Audit/customer relationship manager

This role acts as a liaison between business and IT. If the organization is large, a separate audit/customer relationship manager can be assigned to each major customer group. Where this role exists, some reporting and review responsibilities are transferred from the service level management unit to this unit.

Chief information security officer

The Chief Information Security Officer (CISO) is the highest executive position in organizational security, responsible for ensuring the confidentiality, integrity, and availability of IT assets, information, data, and services. Managing and leading all technical and operational security matters, coordinating implementation of privacy requirements, developing and teaching risk assessment methods, leading risk assessment processes, proposing security controls, security training and awareness, interacting with senior executives about positive security impacts, proposing security budgets, and developing principles for secure system development are among the responsibilities of this role.

Information technology architect

This role is responsible for planning and defining the organization's technical infrastructure. Some responsibilities related to defining standards and evaluating new technologies can also be added to this role's duties.

Special projects manager

Sometimes an organization defines special projects and needs HRs specifically to execute those projects. If available resources cannot meet the needs of these projects, a separate role or function will be needed. The best position for this role is to place it under service delivery.

Procurement/contracts manager

This role falls under financial management, especially if financial management is considered a senior role in the organization. To ensure all new assets are labeled and registered in the CMDB, there must be communication between configuration management and procurement management [8].

7 | King County Case Study

This studied structure creates an effective and high-performance IT organization described from three Different perspectives: Operational structure, reporting relationships, and organizational/interoperational relationships. The proposed structure is described as hierarchical reporting relationships within the executive branch's IT division.

The Office of Information Resources Management (OIRM) within King County has a complex functional role. When a reorganization occurs within the executive branch, OIRM must be accounted for as an executive branch office with advisory, planning, and financial roles for it across all county departments, offices, or agencies, and with management roles for it within executive branch departments. The scope of this reorganization is limited to the executive branch, but it essentially examines the complex role currently called OIRM.

Proposed naming conventions include:

– *King county IT: Describes the IT organization encompassing all roles outlined in directives*
– *Enterprise IT: Describes services provided by Kandla Customs Indian Town (KCIT) to all county departments and services supporting KCIT itself*
– *Decentralized IT: Describes local services provided by KICT at the agency or department level*

Using this nomenclature, King County's IT activities can be organized as shown in *Fig. 3*. Within KCIT, there are three main activity groups color-coded in *Fig. 3*:
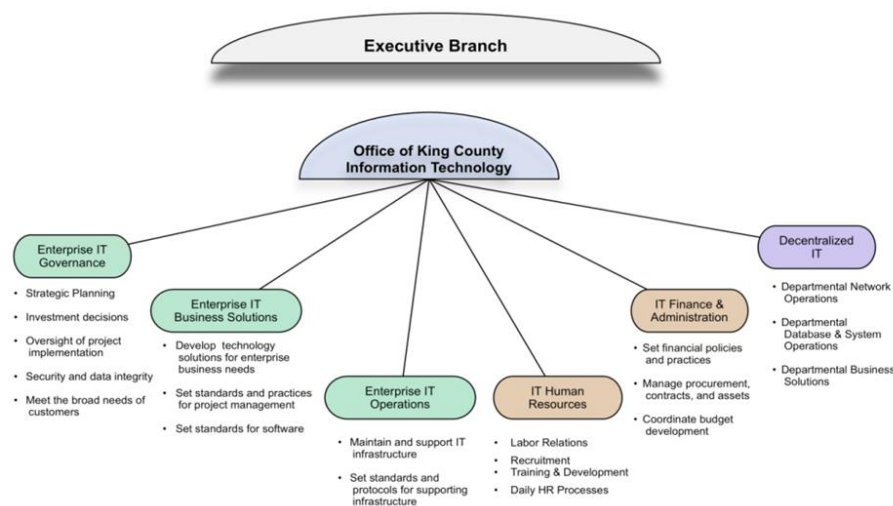

Fig. 3. Proposed organizational chart of King Country.

First group: Activities supporting all of King County as organizational services:

– *Enterprise it governance: Processes managing planning, investment refinement, project implementation oversight, data security/integrity, and meeting customer needs*
– *Enterprise it business solutions: Activities developing technological solutions for King County business needs and standards related to project/software management*
– *Enterprise it operations: Activities maintaining core IT infrastructure for King County, including servers, networks, telecommunications, and supporting standards/protocols*

Second group: Activities centrally established by KCIT to support its organization, including decentralized services:

– *IT HRs: Activities supporting effective employee relations, qualified IT staff hiring, IT staff management/training/development, and daily HRs processes.*
– *IT financial management: Activities establishing financial policies/procedures, managing procurement, and coordinating funds for all executive branch IT and KCIT internal financial activities, like accounting/payroll.*

Third group: Decentralized operations established by KCIT within executive branch IT services:

– *Unified network operations: Activities supporting Local Area Networks (LANs) and desktop applications*
– *Unified system/database operations: Activities managing office servers, databases, and their applications*
– *Unified business solutions: Activities developing technological solutions for specific business unit needs*

Local it financial management: Activities coordinating at the local level with central KCIT management activities for policy distribution, contract preparation, budget development, and accounting [9].

8 | Conclusion

Capability planning is a growing topic in enterprise architecture and strategic planning literature. The agility of this approach has made organizational change and capability development easier than before. By eliminating technical details of underlying activities and presenting a simple, understandable picture of current/desired organizational capabilities, this approach bridges the gap between senior decision-makers and operational managers/lower layers, leading to more precise decision-making.

Breaking down the organization into leader-friendly "Capability" concepts and assessing current/target capabilities across four dimensions (Processes, HRs, tools, intelligence) has been emphasized. A key strength is evaluating different organizational capabilities against the organization's vision, goals, and strategies, with clear, classified job descriptions. This method better aligns organizational capabilities with short/long-term goals.

IT has transformed today's business world and has become inseparable from all professions. As IT permeates business and its impact on organizational productivity/success becomes undeniable, its complexity and requirements continue growing. While initially viewed simply as a tool to make work easier, IT is now a strategic axis and critical organizational dimension. Concepts like IT infrastructure integration, governance, and leadership stem from this remarkable growth. However, this same growth and pervasiveness make mastering this powerful lever essential for realizing organizational vision, requiring a comprehensive understanding of evolving needs and conditions.

The IT unit can serve as management's strategic, organized, and directed arm when it:

– *Understands its responsibilities in achieving organizational goals*
– *Ensures all personnel understand their roles/duties from top to bottom*

The organizational structure - often overlooked - plays vital roles in:

– *Enabling teamwork*
– *Ensuring staff accountability*
– *Increasing plan transparency*
– *Improving planning precision*
– *Optimizing resource allocation*

Therefore, defining IT unit structures should build on successful frameworks/models. This paper highlighted the importance of IT organizational structure and how to define it across organizations of varying sizes using international standards/frameworks.
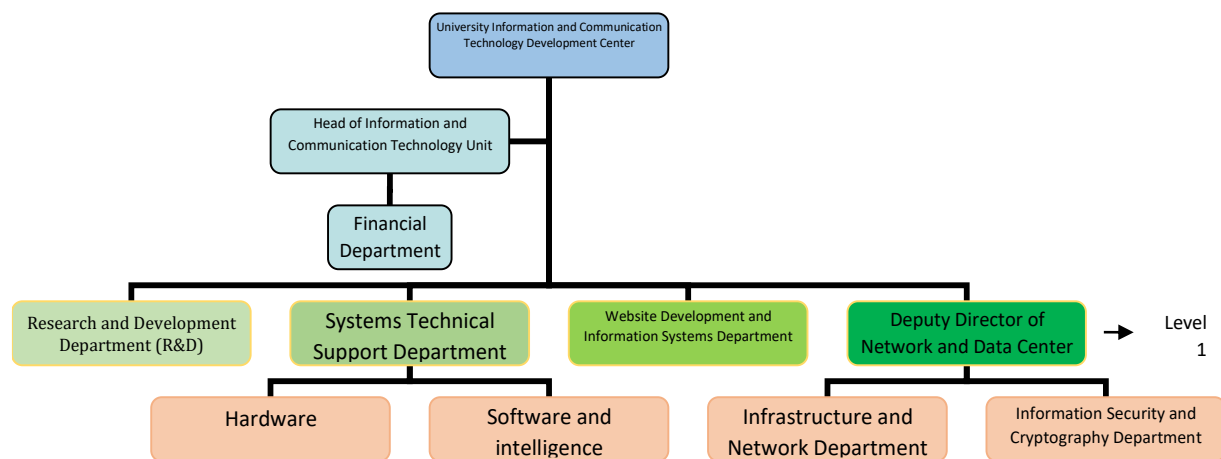

Fig. 4. Proposed organizational chart of the University Information and Communication Technology Development Center based on ITIL V4.

The ITIL V4 and COBIT frameworks were introduced to answer "How to organize IT units?" An organizational structure (*Fig. 4*) was proposed for university IT management based on ITIL V4, including:

– *Unit responsibilities*
– *Staffing requirements*
– *Needed specialties*

In *Fig. 4*, IT center unit priorities are color-coded (Darker colors indicate higher priority). Recognizing that ITIL V4 provides extensive organizational details, we examined models from two reputable organizations incorporating ITIL V4 guidelines. Finally, King County's organizational chart was analyzed for clarity.

However, research opportunities remain regarding:

– *How organizational structure impacts performance*
– *How IT structures interact with other organizational units*

These represent potential future research directions.

References

[1]   Weinzimer, P. (2018). *The strategic CIO: Changing the dynamics of the business enterprise*. Auerbach Publications. https://www.amazon.com/Strategic-CIO-Enterprise-Weinzimer-2014-10-29/dp/B01FEKM3LY

[2]   Lainhart IV, J. W. (2000). Why IT governance is a top management issue. *Journal of corporate accounting & finance*, *11*(5), 33–40. https://doi.org/10.1002/1097-0053(200007/08)11:5%3C33::AID-JCAF6%3E3.0.CO;2-U

[3]   Hussain, S. J., & Siddiqui, M. S. (2005). Quantified model of COBIT for corporate IT governance. *2005 International conference on information and communication technologies* (pp. 158-163). IEEE. https://doi.org/10.1109/ICICT.2005.1598575

[4]   Blair, A., & Marshall, S. (2016). Open group guide business capabilities. *The open group*.

[5]   Briefing Paper. (n.d.). *ITIL Organization Structure*. https://www.inf.ufsc.br/~joao.dovicchi/pos-ed/pos/gerti/ITIL/ITIL_Organisation_Structure.pdf

[6]   Kekkonen, A., & Arasmo, S. (2016). *Future trends of service desk*. https://urn.fi/URN:NBN:fi:amk-201605096659

[7]   Jamaseb, B., Ghorbani, F., & Khayami, S. R. (2018). Information technology management organizational structure model based on ITIL. *The second national conference on enterprise architecture advances*. Shiraz, Iran, Civilica. (**In Persian**). https://civilica.com/doc/908553/

[8]   Wiki, I. P. (2018). *The ITIL Wiki. ITIL Strategy Management*. https://wiki.en.it-processmaps.com/index.php/ITIL_Strategy_Management

[9]   Gov, K. C. (2018). *Recommended Executive Branch IT Organizational Structure*. https://kingcounty.gov/en/404.html