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The Impact of ICT in Enhancing Public Administration Efficiency: A Case Study of Anantapur district, Andhra Pradesh

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Abstract

Modern information and communication technology may potently enhance corporations' and other organizations' quality and efficiency. Technological advances and the fast adaptability to human requirements have created a new learning and interaction environment that is more creative, dynamic, and inclusive. Anantapur district headquarters' general administrative departments are examined for their use of information and communication technology (ICT) to improve public administration efficiency. This study has a descriptive-correlative methodology and utilized a survey questionnaire with 180 government employees from Anantapur general administrative departments as a sample of the study. As a result, the organization's performance will increase when information and communication technology (ICT) can be used using suitable metrics. In terms of type, Correlation indicates the connection between these two variables. Anantapur's government departments have found that using modern technology has improved performance, customer happiness, transparency, and accountability while also lowering the incidence of administrative corruption. As a consequence of the findings of this research, we can conclude that attention and investment in information and communications technology (ICT) and capacity development are critical for all Andhra Pradesh government departments.

Keywords: *Competencies of Employees, Employees' Dedication, Efficiency, innovation, ICT*

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Introduction

In the past half-century, advances in computer and communication technology have transformed a broad range of aspects of human existence. Information and communication technologies, often known as like-new or advanced technologies, have significantly affected people's lives since humans first invented them. The history books are packed with examples of these innovations. A sea change is afoot in the realms of communication and information generation; now, we see them merging and transmitting data and information faster than anybody could have imagined. As a result of the increasing use of information and communication technologies, the world is quickly transitioning towards an information society.

It's a society where information and how much access people have to it and their ability to utilize it are critical. Due to the wide range of applications it has and the profound effect it will have on human society now, and in the future, it has emerged as one of the world's most pressing issues, attracting the attention of many nations [1].

When the recent three decades of development are compared, "they show that current advancements are fundamentally different from those in the past, with the revolution occurring in these decades as the primary cause for these changes" [2]. These decades have seen an explosion in information and communication technologies, giving rise to the term Information and Communication Revolution.

The usage of "information and communication technology (ICT)" has grown along with a wide range of information systems created to meet various requirements. Management may better interact with the company and its workers by using this tool [3]. ICT has multiple effects on an organization, including boosting involvement in decision-making, speeding up decision-making, lowering the pyramid's height, and better coordination. A manager should know what information systems and information technology their company may benefit from before making spending or investment choices about using it [4]. Measure the effect of ICT on the quality of products and services, customer service improvements, and communication and information improvements. These are the main success factors for today's organizations [5]. As a result, the study aimed to examine how information and communications technology (ICT) might improve public administration efficiency and make better use of technology.

Statement of the Problem

In today's society, using information and communications technology (ICT) to cooperate with the international community is a must. Methods, techniques, procedures, and systems used in Information and Communication Technology (ICT) help collect, transmit process, disseminate, and evaluate information [6]. All transmission, exchange, storage, and management routes for information may be transformed or optimized by information and communication technology [7]. Organizations must have the necessary expertise and experience to make the most use of information and communications technology (ICT). Organizational culture will determine whether or not the relocation is a success for the company. "When information technology is based on the current state and strategies of the company culture, it may lead to good transformation" [8]. Hence, the researcher's goal is to examine how information and communication technology may improve the efficiency of public administration in Anantapur, Andhra Pradesh, particularly in the general administrative departments.

Objectives of the study

- To examine how information and communications technology (ICT) may improve public administration efficiency.
- To draw attention to the impact of "information and communications technology (ICT)" on employee skills
- To assess the role of information and communications technology "(ICT) in the development activities and innovation" in the personnel's job.

Hypotheses of the study

H1: Anantapur's general administrative departments are more efficient thanks to advances in information and communication technology.
H2: Anantapur's general administrative departments' employees' skills are influenced by ICT.
H3: Anantapur's general administrative departments are influenced by employee commitment.
H4: "Information and communications technology" influence the "development of activities" in Anantapur's general administrative departments.
H5: In Anantapur's general administrative departments, ICT influences innovation in work.

Methodology

Simple random sampling was used in this study, and data were gathered between August and September of 2021 as the sampling technique. The Anantapur government general department employees who live in district

headquarters make up the study's statistical population. Using Chronbach's formula for questionnaire validity, the researchers selected a sample of 180 employees (of whom 30 were female, and 150 were male).

Table-1: Chronbach's alpha reliable coefficients of the questionnaire

Variables	Chronbach's alpha coefficient
ICT	0.900
Competencies of Employees	0.803
Employees' Dedication	0.768
Planned Activity for Development	0.702
Workplace innovation	0.631
Efficiency	0.874

Source; primary data from fieldwork

Table-1 shows that Chronbach's alpha coefficient for all variables is more than 70%. As a result, the survey's results are very reliable.

The study area:

The district of Anantapur (formally known as Anantapuramu district [9]) is located in the Rayalaseema region of Andhra Pradesh, India. Anantapur city serves as the district headquarters. It's one of South India's driest regions. According to India's 2011 census, it is the state's most populated district and its largest area (4,083,315). Anantapur district, India's 7th most populated district, has a population of 4,081,148 people living in 9 68,160 homes, according to the 2011 census. With a total size of 19,130 km2, it's the state's biggest district (7,390 sq mi) [10]. It is estimated that 977 women outnumber 1000 men in Anantapur. The literacy rate is 64.28 percent [11]. The district's urban population makes up 28.9% of the overall population. There is a 6.8% contribution to the Gross State Product from the district's GDDP of 35,838 crores (US$5.0 billion) (GSDP). Per capita income was 69,562 (US$980) in FY 2013–14 at current prices. A total of Rs. 9,944 crore (US$1.4 billion) is contributed to the GDDP by the district's primary, secondary and tertiary sectors, respectively (US$1.1 billion), (US$1.2 billion), and (US$2.5 billion) [12]. A total of five revenue divisions exist in the district, including Anantapur, Dharmavaram, Kadiri, Kalyandurg, and Penukonda. In 2013, the divisions of Kadiri and Kalyandurg were established. The 63 mandals that make up these revenue divisions are split even further.

Analyses of data:

To show the impact of "the independent variable (ICT)" on the dependent variable was the study's main objective ("Efficiency of public administration").

Table-1: "the Pearson correlations between (ICT) and employee competencies"

	ICT	Competencies of Employees
"ICT Pearson Correlation	1	0.623**
Sig. (2-tailed)		0.000
N	180	180
ICT Pearson Correlation	0.631**	1
Sig. (2-tailed)	0.000	
N	180	180".

** "Correlation is significant at the 0.01 level (2-tailed)".

When we look at the correlation coefficient (0.623) and the significance level (0.000), we see that information and communication technology (ICT) and the general department's personnel competencies have a positive and strong connection (99 percent "confidence").

Table-2: "Pearson Correlations between ICT and Employee's Dedication"

		ICT	Employee's Dedication
"ICT	Pearson Correlation	1	0.687**
Sig. (2-tailed)			0.000
N		180	180
ICT	Pearson Correlation	0.687**	1
Sig. (2-tailed)		0.000	
N		180	180".

**. Correlation is significant at the 0.01 level (2-tailed).

"The correlation coefficient is 0.687, with a significance level of 0.000", indicating that information and communication technology (ICT) and departmental staff dedication are positively associated.

"Table-3: Pearson Correlations between ICT and Planned Activity for Development"

		ICT	Planned Activity for Development
"ICT	Pearson Correlation	1	0.531**
Sig. (2-tailed)			0.000
N		180	180
ICT	Pearson Correlation	0.531**	1
Sig. (2-tailed)		0.000	
N		180	180".

** "Correlation is significant at the 0.01 level (2-tailed)".

The findings show that "the correlation coefficient is 0.531, and the significance level is 0.000. Therefore, there is a Positive and reasonably strong connection between information and communication technology and the development of activities in the general administrative departments of Anantapur with confirmation of 99 percent confidence".

Table-4: "Pearson Correlations between ICT and Workplace Innovation"

		ICT	Workplace innovation
"ICT	Pearson Correlation	1	0.635**
Sig. (2-tailed)			0.000
N		180	180
ICT	Pearson Correlation	0.635**	1
Sig. (2-tailed)		0.000	
N		180	180".

**. Correlation is significant at the 0.01 level (2-tailed).

As a consequence of the findings, the correlation coefficient was found to be 0.635, and the significance level was found to be 0.000, indicating that information and communication technology has a positive and reasonably strong connection with innovation in work in Anantapur's general department, with 99 percent certainty.

Table-5: "Pearson Correlations between ICT and Efficiency of general administrative Department"

		ICT	Workplace innovation
"ICT	Pearson Correlation	1	0.725**
Sig. (2-tailed)			0.000
N		180	180
ICT	Pearson Correlation	0.725**	1
Sig. (2-tailed)		0.000	
N		180	180"

** "Correlation is significant at the 0.01 level (2-tailed)".

"The correlation coefficient is 0.725, with a significance level of 0.000, indicating a positive and substantial connection between information and communication technology and the efficiency of Anantapur's general administration department", which has been confirmed with a 99 percent confidence level.

Analysis of the First Component:

H0: In Anantapur's general administrative departments, "information and communication technology" has no impact on employees' competencies.

H1: In Anantapur's general administrative departments, information and communication technology affects employees' competencies.

Table-6: "Model Summary: ICT and Employee's competencies"

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Significance
1	0.623$	0.387	0.382	2.46874	0.000

$ Predictors; (Constant), ICT, Dependent variable: Employee's competencies

"The correlation coefficient between ICT capabilities and employee competencies is (0.623), the significance level is (0.000). As a result, ICT and employee competencies have a positive, direct, and reasonably strong connection, with an alpha value of (0.01) and a confidence level of (0.99)". ICT also affects employee abilities, as shown by the determination coefficient's findings (R^2= 0.387).

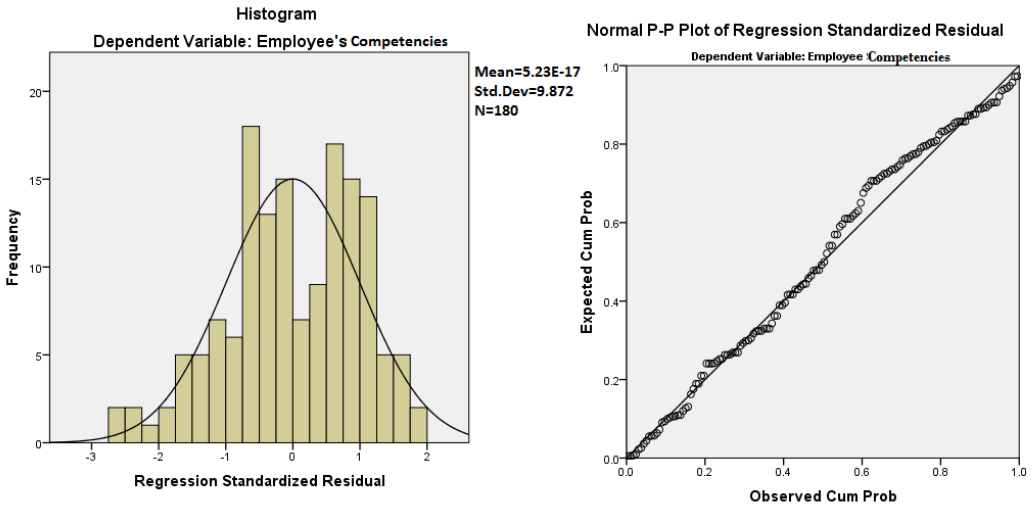
Table -7: ICT's (independent variable) regression coefficient relates to the "dependent variable" (Employee's competencies).

Model		Understand Coefficients		Standardized Coefficients	T	Significance
		Beta	Std. Error	Beta		
1	(Constant)	4.715	1.381	0.623$	3.421	0.001
	ICT	0.228	0.22		9.882	0.000

Note: $ dependent Variable: Employee's competencies. "Beta is equal to the Correlation between the independent and dependent variables" when only one independent variable is present.

"The non-standardized regression coefficient (0.228) is significant at a high level (0.000)". That's a change of (0.228) units in an employee's competencies for every change in information and communication technologies. In other words, if R2 is deemed 100 percent successful in terms of employee competencies, ICT is just 22.8% effective. ICT significantly impacts employee abilities, as shown by the t-statistic value, which exceeds 0.62, with a significant value of 0.000 and an error value of 0.01. As a result, the first sub-hypothesis has been proven true.

Graph-1: dependent Variables: Employee's competencies



When looking at graphs, it's clear that the actual cumulative probability is quite close to the anticipated value. "There is a correlation between the independent variable (ICT) and dependent variables (Employee's Skills) since the dots are gathered around the diameter. Nearly every instance of cumulative probability observed is the same as anticipated cumulative probability. And the dots' departure from the line is more diminutive".

"Analysis of the Second Component":

H0: "Information and communication technology" has little effect on Anantapur's employees' dedication to the department's general administration.

H1: The employee's dedication to Anantapur's general administrative department is influenced by information and communication technology.

Table-8: "Model Summary: ICT and Employee's dedication"

"Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Significance"
1	0.627$	0.397	0.392	2.56874	0.000

$. Predictors; Constant; ICT

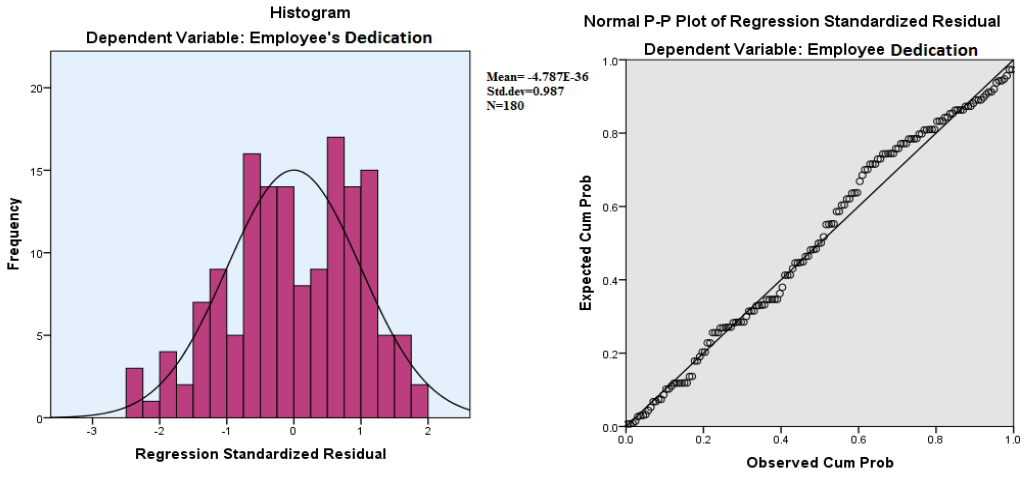
The findings indicate a (0.627) correlation coefficient between ICT dedication and employees, with a significance level of 0.05. (0.000) ICT and employee dedication are positively related, directly, and reasonably strong. This connection is verified by "an alpha value of (0.01) and a confidence level of (95%) (0.99)". ICT also affects employee commitment, as shown by the determination coefficient's findings (R2= 0.397).

Table -9: ICT's (independent variable) regression coefficient relates to the dependent variable (Employee's dedication).

"Model		Understand Coefficients		Standardized Coefficients	T	Significance"
		Beta	Std. Error	Beta		
1	(Constant)	4.378	1.481	0.633$	3.021	0.003
	ICT	0.238	0.24		9.872	0.000

"The non-standardized regression coefficient (0.238) is statistically significant at a significant level (0.000)". The average change in information and communication technology (ICT) results in a change in employee dedication of (0.238) units per unit of ICT change. In other words, if R^2 is regarded to be 100 percent successful in terms of employee dedication, ICT is just 23.8% effective in that regard. Additionally, the t-statistic value of higher than 2.33, with a significant level of 0.000 and an error level of 0.24, indicate that information and communications technology (ICT) substantially impacts employee dedication. As a result, the second sub-hypothesis has been proven correct.

Graphs-2: "Dependent variable: Employee's dedication".



"The graphs' findings indicate that the observed cumulative probability is quite close to the predicted one. Dots around the circumference indicate a correlation between the independent variable of ICT and its dependent, the employee's level of dedication, and nearly every instance of observed cumulative probability matches the expectation for that variable. And the dots' departure from the line is less".

"Analysis of the third Component":

H0: Anantapur's general administrative departments are unaffected by information and communication technology's planned activity for development.

H0: Anantapur's general administrative departments use information and communication technology (ICT) to impact their planned activities for development.

Table-10: "Model Summary: ICT and planned activity for development".

"Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Significance"
1	0.527$	0.268	0.254	2.98633	0.000

$. Predictors: (Constant),ICT

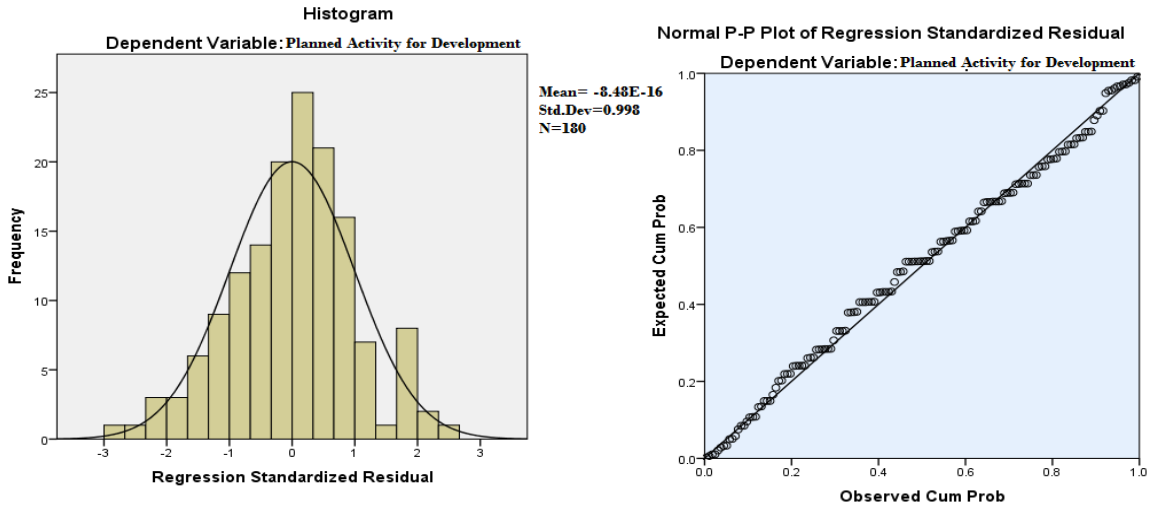
The findings showed a significant relationship between ICT skills and employee productivity, which showed a correlation coefficient of (0.000). As a result, ICT and Activity Development have a positive, direct, and moderately strong connection, supported by "an alpha value of (0.01) and a confidence level of (0.99)". ICT also affects activity development, as shown by the determination coefficient's findings (R^2= 0.268).

Table -11: ICT's (independent variable) regression coefficient relates to the dependent variable (planned activity for development).

"Model		Understand Coefficients		Standardized Coefficients	T	Significance"
		Beta	Std. Error	Beta		
1	(Constant)	4.582	1.681	0.523$	2.683	0.008
	ICT	0.198	0.027		7.476	0.000

There is a statistically significant non-standardized regression coefficient (0.198) in this study (0.000). Thus, "one unit change in information and communication technology (ICT)" results in an average 0.198-unit change in the development of activities. Using R2's 100 percent effectiveness, ICT is only 19.8% as effective as R2 in terms of Activity Development. ICT significantly affects activity development, as shown by the t-statistic value, higher than 2.68, significant at the 0.000 level, and erroneous at the 0.01 level. In this way, the third hypothesis has been proven correct.

Graphs-3: Dependent variable: planned activities for Development



The graphs' findings indicate that the observed cumulative probability is quite close to the predicted one. This means that because the dots cluster around the diameter, "there is a connection between the independent variable (ICT) and the dependent variable (Development of Activities), and nearly every instance of observed cumulative probability matches the anticipated cumulative probability. And the dots' departure from the line is less".

Analysis of the fourth Component:

Table-12: "Model Summary: ICT and workplace innovation".

"Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Significance"
1	0.635[$]	0.387	0.365	2.53167	0.000

$. Predictors: (Constant),ICT

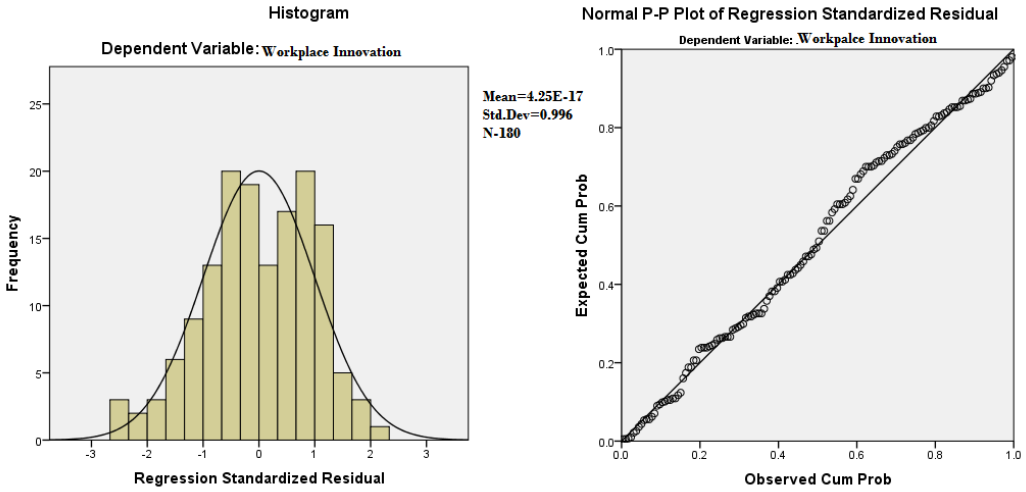
The findings revealed a (0.635) correlation coefficient and a significant level of ICT and innovation in the workplace (0.000) Since ICT and innovation in the workplace are linked directly and positively "by an alpha value of (0.01) and a confidence level of", there is a significant connection between the two (0.99). ICT also affects work-related innovation, as shown by the determination coefficient's findings (R2= 0.387).

Table -13: ICT's (independent variable) regression coefficient relates to the dependent variable (Workplace Innovation).

"Model		Understand Coefficients		Standardized Coefficients	T	Significance"
		Beta	Std. Error	Beta		
1	(Constant)	4.878	1.398	0.623	3.567	0.001
	ICT	0.214	0.023		9.648	0.000

There is a statistically significant non-standardized regression coefficient (0.214) in this study (0.000), which means that on average, for every (0.214) unit of IT innovation, there will be (0.214) units of innovation at work. As a result, if R2is seen to be 100 percent successful with regard to workplace innovation, ICT is just 21.4 percent effective. ICT has a substantial impact on innovation in the workplace based on the "t-statistic value, which is higher than 2.33, with a statistically significant level (0.000) and an error level (0.01)". In this way, the Fourth Sub-hypothesis has been shown to be true! Dependent variable graphs: Workplace Innovation.

Graphs-4: Dependent variable: workplace innovation



Graphs demonstrate that the observed cumulative probability is almost identical to the anticipated cumulative probability. "There is a correlation between the independent (ICT) and dependent (Innovation in Work)" variables because the dots cluster around the diameter. Nearly all of the cumulative probabilities observed match the predicted cumulative probabilities. And the dots' departure from the line is less.

"Analysis of the fifth Component":

H0: The efficiency of Anantapur's general administrative Departments is unaffected by information and communication technology.
H1: The efficiency of Anantapur's general administrative departments is influenced by information and communication technology.

Table-14: "Model Summary: ICT and workplace innovation".

"Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Significance"
1	0.735[$]	0.532	0.529	7.14760	0.000

$. Predictors: (Constant),ICT

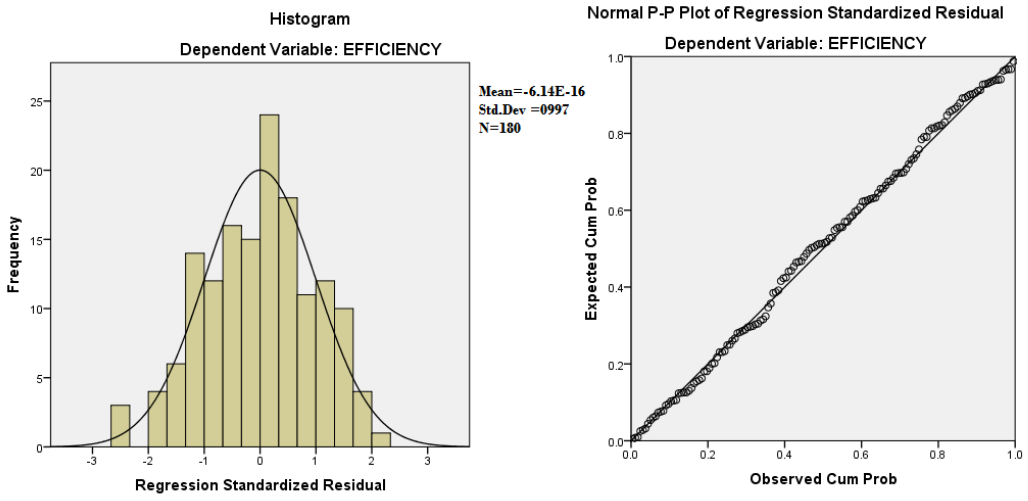
"A correlation value of (0.735) and a significance level of (0.000)" have been found between information and communication technologies (ICTs) and efficiency. In other words, ICT and Efficiency have a strong and positive connection that is verified "by an alpha value of (0.01) and a confidence level of (95%) (0.99)". A study conducted by Anantapur's general administrative departments found that the use of information and communications technology (ICT) improved efficiency (R2= 0.532).

Table -15: ICT's (independent variable) regression coefficient relates to the dependent variable (Efficiency).

"Model		Understand Coefficients		Standardized Coefficients	T	Significance"
		Beta	Std. Error	Beta		
1	(Constant)	16.879	3.898	0.732	4.259	0.00
	ICT	0.812	0.62		12.751	0.000

"The findings show that the non-standard regression coefficient (0.812) is significant at a significant level (0.000). Thus, one unit change in information and communication technology efficiency results in an average difference of (0.812) units". Assuming R2 is 100 percent efficient, ICT is 81.7 percent efficient. Additionally, the t-statistic value of higher than 2.33, with a significance level of 0.000 and an error level of 0.01, indicates that information and communications technology (ICT) substantially impacts efficiency. As a result, the main hypothesis has been proven.

Graphs-4: Dependent variable: Efficiency



The graphs' findings indicate that the observed cumulative probability is quite close to the predicted one. "There is a correlation between the independent (ICT) and dependent (Efficiency)" variables because of the clustering of dots around the diameter. Nearly every instance of cumulative probability found matches the anticipated cumulative probability. "And the dots' departure from the line is less".

General Discussion

ICT has a statistically significant impact, as shown by data showing a correlation between increased ICT and better public sector management in the region. According to the study's conclusions, ICT has a positive influence on government administration efficiency. Information and communication technology (ICT) efficiency increases with ICT appropriateness and efficiency among workers. The study findings provide a better explanation for the overall outcomes. As a rule, government expenditures in information and communications technology (ICT) lead to organizational changes to improve policy efficiency and effectiveness [14].

According to the study's findings, information and communication technology usage has been shown to be positively associated with staff skills. These two variables have a lower degree of significance since the "average regression coefficient (R = 0.623), and its regression coefficient (B = 0.216) were found to be less significant than alpha". Since ICT affects staff skills, the first study hypothesis is confirmed. This study's results show that information and communications technology (ICT) has a beneficial effect on public sector management. According to the study's findings, usage of information and communication technology (ICT) is positively associated with employee dedication. These two variables have a lower degree of significance since "the average regression coefficient (R = 0.627), and the regression coefficient found (β = 0.222)" are less. In other words, ICT affects employee dedication, which confirms the Second study hypothesis.

The study's findings show that the usage of "information and communication technology and the development of activities have a significant and beneficial connection. R=0.527 and its regression coefficient (β=0.198)" were achieved due to its significance level being less than alpha and the average regression coefficient. These findings support the third study hypothesis that information and communication technology (ICT) affects development activities.

According to the study's conclusions, "information and communication technology and innovation" in the workplace have a significant and beneficial connection. This is because the difference in "significance between the two variables is less than alpha, and the average regression coefficient is". In other words, ICT affects workplace creativity, validating the fourth study hypothesis. The study's findings show a significant and favorable link between Anantapur's general administrative departments' information and communication technology usage and efficiency. These two variables are less significant since their average regression coefficient (β=16.779; R=0.735) and correlation coefficient (R=0.735) are lower than the alpha's average Because ICT affects Anantapur's overall productivity and effectiveness, this supports the theory that I originally put forward during my study.

Conclusion

Modern information and communication technology may potently enhance corporations' and other organizations' quality and efficiency. Technological advances and the fast adaptability to human requirements have created a new learning and interaction environment that is more creative, dynamic, and inclusive [15]. Training in "information and communication technology is at the heart of many organizations" since it improves fundamental abilities like reading, writing, calculating, and thinking, but it also can improve information literacy. ICTs may significantly impact organizational and employee performance, as this study and others have shown. This means that the organization and management must use "these technologies and their capabilities to empower their workers and eventually the whole company". They must also create suitable plans and the right strategy for using these capabilities. As a result, academics and practitioners in public administration need to enhance empirical research to move forward.

Finally, considering the findings of this research, it should be noted that ICT has the potential to impact (employee competencies, employee dedication, planned activity for development, and workplace innovation and efficiency). As for Anantapur's general administrative departments, it can be stated that the use of modern technology has resulted in enhanced organizational performance and customer satisfaction as well as more

openness and accountability. As a result, attention and investment in information and communication technology (ICT) and capacity development are critical for all Indian government agencies.

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