

## **WORKFLOW MANAGEMENT SYSTEM AND ORGANIZATIONAL PRODUCTIVITY OF CONSTRUCTION COMPANIES IN RIVERS STATE, NIGERIA**

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### **ABSTRACT**

The study investigated the relationship between workflow management system and organizational productivity of construction companies in Rivers State. The cross sectional survey design was adopted in the assessment of the study variables in the study. The study population comprised of the 22 twenty-two Construction companies in Rivers State. The research selected three managerial staff members from each of the firms under study making it total of 66 sixty-six study elements. Data were generated from the respondents by the use of a well-structured questionnaire. Pearson's product moment correlation, partial correlation and multiple regressions were used to test the hypotheses with the aid of statistical packages for social science (SPSS) version 23.0. Based on the findings, the study concluded that Workflow Management System: Process Modelling, Workflow Scheduler and Workflow Resource Allocator have a positive significant relationship with productivity of construction companies in Rivers State. The study therefore recommended amongst others, that Managers of construction companies should provide the listed elements mentioned in this study to reciprocate the expectation of managers as they are key to productivity through workflow management system.

**Keywords:** Workflow Management System: Process Modelling, Workflow Scheduler and Workflow Resource Allocator, Task Accomplishment, Profitability and Quality Service Delivery

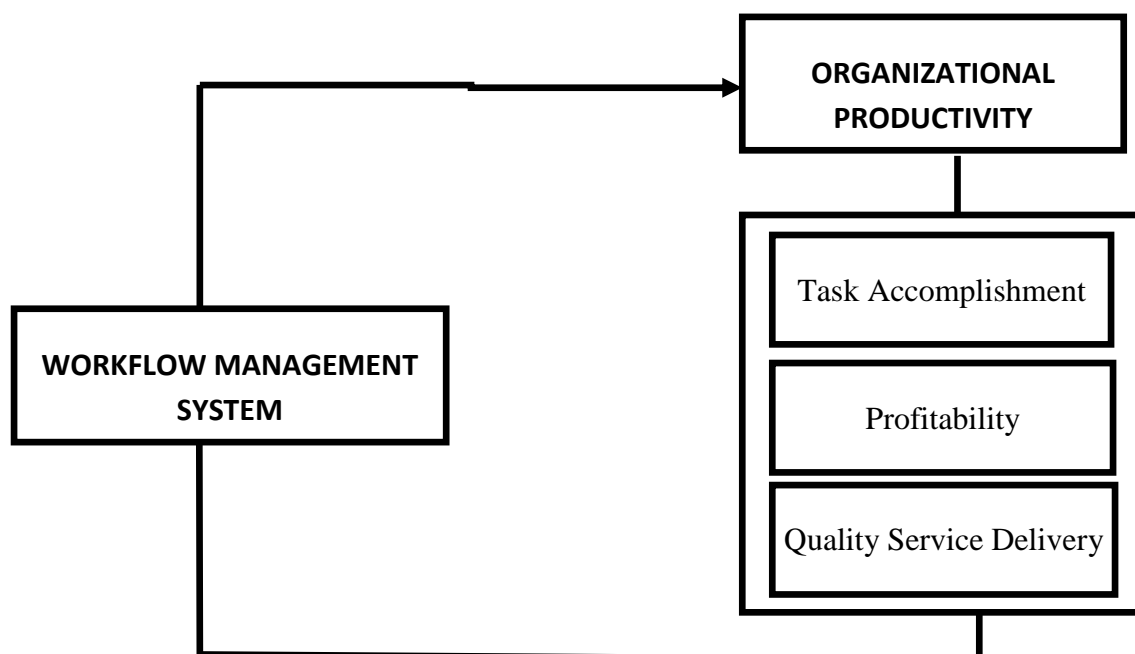
### **INTRODUCTION**

Organizations, just like the humans, struggle for survival in their business settings. Due to the changes such as technological advances, growing and changing customer demands, competitive forces, changes in the labor force and environmental and political concerns, it has become much more important for the organizations to be able to quickly respond and adapt to this dynamic environment (Bhatt & Zaveri, 2002). In order to survive and stay competitive, firms nourish new ideas, process better ways of doing things, develop new products and technologies, and accomplish all those tasks to grow and become better at what they currently do (Malone, 2002). Workflow is the definition, execution and automation of business processes where tasks, information or documents are passed from one participant to another for action, according to a set of procedural rules. Organizations use workflows to coordinate tasks between people and synchronize data between system, with the ultimate goal of improving organizational efficiency, responsiveness and profitability. Workflows automate the flow of employee tasks and activities, reducing the time the process took to complete as well as potential errors caused by human interaction (John-Otumu, Konigene & Imhanlahimi, 2015).

Workflows make processes more efficient, complaint, agile, and visible by ensuring that every process step is explicitly defined, monitored over time, and optimized for maximum productivity. Given optimal, up to date minute process data, managers and employees can take quicker action and make smarter decisions (John-Otumu, et al., 2015). Workflows empower business users and Information Technology to work together to rapidly modify

system and processes to reflect changes in the business. Application of workflow technology to mobile computing, system management multi databases the interneer application development, object technology, operating system, and transaction management has been discussed extensively by (Leymann & Roller, 2000). A workflow may describe business process tasks at a conceptual level necessary for understanding, evaluating, and redesigning the business process. On the other band, workflows may capture information process tasks at a level that describes the process requirements for information system functionality and human skills (John-Otumu, et al., 2015).

In the most recent literature, the Construction Sector in Rivers State has become immersed in the endearing challenges of negative productivity and poor management of its resources; particularly regarding the automation of its processes. This age-long challenge has been greeted by different researchers and scholars in the field of administrative sciences research. These challenges when compounded overtime has adverse effects on the growth and sustainability of these businesses, thereby causing them to get extinguished. The issue associated with workflows management has been a matter of serious discourse from different scholars. At different points and times, some of these scholars have opined how most organizations tend to suffer competing interests, to wit: the poor automation of processes amongst departments. This generates severe drawbacks that have the proximate potency to mar the organizational process, thereby affecting productivity level. Thus, it has become imperative for organizations, in this case, Construction companies in Rivers State, Nigeria to understand the need to meticulously manage the its diversified work processes as this would help them achieve productivity in business structures that can stand the test of time. This study is poised to investigate the relationship between workflow management system and organizational productivity of construction companies in Rivers State.



**Fig1:** Conceptual framework of Workflow Management System and Organizational Productivity of Construction Companies in Rivers State, Nigeria.

**Source:** Research Desk, 2023

## **Theoretical Foundation Of The Study**

**Diffusion of Innovations Theory:** Rogers' diffusion of innovations theory is the most appropriate for investigating the adoption of technology in higher education and educational environments (Medlin, 2001; Parisot, 1995). In the face of this fact, much diffusion research involves technological innovations; so Rogers (2003) usually used the word "technology" and "innovation" as synonyms. For Rogers (2003), "a technology is a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome". It is composed of two parts: hardware and software. While hardware is "the tool that embodies the technology in the form of a material or physical object," software is "the information base for the tool" (Rogers, 2003). Flowing from the aforementioned scholarly underpinnings with emphasis to the position of Medlin (2001), it suffices to say that the thrust of innovation is embedded in Information and Communication Technology; hence suitable for the study of Workflows Management and Productivity of Construction Companies in Rivers State, Nigeria.

## **LITERATURE REVIEW**

### **Concept Of Workflows Management**

Workflow is the definition, execution and automation of business processes where tasks, information or documents are passed from one participant to another for action, according to a set of procedural rules. Organizations use workflows to coordinate tasks between people and synchronize data between system, with the ultimate goal of improving organizational efficiency, responsiveness and profitability. Workflows automate the flow of employee tasks and activities, reducing the time the process took to complete as well as potential errors caused by human interaction (John-Otumu, Konigene & Imhanlahimi, 2015).

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Workflow Management or Business Process Management (BPM) is the practice of evaluating, enhancing, and monitoring the business processes for continuously improving them (Houy, Fettke, & Loos, 2010). In other words, Workflow Management is a way to oversee what kind of tasks are there in the organization and how those tasks are executed and performed. Moreover, BPM helps an organization to keep continuous eye on what is going on and discovering opportunities for process development and improvement (Dumas, La Rosa, Mendling, & Reijers, 2013; Rosemann & De Bruin, 2005). Therefore, BPM can be broadly

described as a provider of tools and techniques to efficiently manage business processes (Huang, van der Aalst, Lu, & Duan, 2011). BPM plays a key role in the advancement of an organization, especially which focuses on a business process view (Kohlbacher, 2009) because BPM can provide interaction, control, analysis, and optimization of processes (Smith, 2003).

Workflows are a part of any organization and they shape how the respective organization runs its business. The way processes are designed and performed affects both the quality of service that customers perceive and the efficiency with which services are delivered (Dumas, et al., 2013). At present, organizations behavior and their customers' expectations are changing rapidly due to many reasons such as technological upgrades, and new inventions (Brzywczy, 2017). As such, workflows need to be continuously monitored and relevant changes should be introduced. Workflows Management was originated as the next big thing after the workflow wave (Anand, Wamba, & Gnanzou, 2013). Currently, it has evolved in many concepts such as Business Process Management (BPM), case handling (CH), enterprise application integration (EAI), enterprise resource planning (ERP), and customer relation management (CRM) (Weske, Aalst, & Verbeek, 2004).

**Process Modeling:** Models in essence are a means for explicating, agreeing and managing information in a well-defined and structured manner (Ludewig 2003). Without a model, it would become very difficult to manage vast amounts of information in a coherent manner and come to any form of common understanding. Moreover, the capability to store information means that models often provide a rich means of managing documentation concerns, by preserving the information for future referencing and possible reuse for other purposes.

**Workflow scheduler:** The term workflow scheduling refers to the resource planning, i.e., the spatial and temporal mapping of workflow tasks onto resources (Wieczorek, Hoheisel & Prodan, 2009). Workflow is a collection of tasks organized to accomplish some scientist process. It also defines the order of task invocation or conditions under which task must be invoked, task synchronization, and information flow. In workflow scheduling, applications and services can be decomposed into sets of smaller components, called tasks. Different sub tasks of a workflow application are allocated resources in such a way that some pre-defined objective criteria are met.

**Workflow resource allocator:** Workflow is a technology that provides the ability to define and automate the flow of work through an organization to accomplish business tasks. A workflow process involves the coordinated execution of tasks performed by workflow resources (e.g., a person, a computer-based application, or a piece of equipment). One of the important features of modern workflow technology is the dynamic resource allocation, which provides resource independence to business processes.

Resource management is an important and complicated task, especially in enterprise workflow environments (Du, Davis, Huang & Shan, 1999).

### **Organizational Productivity**

**Task Accomplishment:** The attainment of work goals is of critical importance for individual and organizational success (Kanter & Brinkerhoff, 1981). Goals are believed to direct attention, energize behavior, increase employee persistence, and stimulate strategy development (Locke & Latham, 1990). Providing a dynamic view of goal regulation, Carver

and Scheier (2000) emphasized the roles of discrepancy detection and discrepancy reduction in striving to accomplish tasks. According to Carver and Scheier (2000) individuals manage their behavior in relation to their goals by comparing their current level of performance against the desired level of performance to determine if a discrepancy is present (e.g., performance is below the goal). If a discrepancy is sensed, individuals are expected to engage in behaviors aimed at reducing the discrepancy.

**Profitability:** Maximization of profit is a very crucial objective for a firm to remain in business and to withstand competition from firms operating in similar industry. It is a major pre-requisite for long-term survival and success of a firm while it is a key pre-condition for the achievement of other financial goals of a business entity (Gitman & Zutter, 2012).

**Quality Service Delivery:** Delivering services of high quality is an important pursuit for service providers that seek to create and provide value to their customers (Gronroos & Ravald, 2011). Through the provision of high levels of service quality, companies can achieve increased customer satisfaction, loyalty and therefore long-term profitability (Zeithaml & Bitner, 2000). In order to provide high levels of service delivery and therefore create value for their customers, service organizations need to plan the delivery of their services and to ensure the successful implementation of the actual plan (Parasuraman, Beny & Zeithaml, 1988).

## METHODS

The study adopted census survey strategy; as a result, the entire 22 Construction Companies in Port Harcourt were surveyed. As such, 66 top, senior and junior managerial cadres were studied. The study used structured questionnaire as a means of generating primary data from the respondents of the study. Structured questionnaire was used to enable the researcher find out the attitude, knowledge and feelings of respondents on questions asked with respect to the study variables in order to enable the study derived very relevant responses. To determine the internal reliability, the survey instrument was assessed by means of Cronbach alpha coefficient. Hence, only the items that returned alpha values of 0.7 and above were considered. Cronbach's alpha was used for the coefficient of reliability (or consistency). To empirically evaluate the hypothesized relationships, the Pearson's Product Moment Correlation was used in testing the various hypotheses with help of the Statistical Packages for Social Sciences (SPSS) Version 23.0.

**Table 4.24 Correlation Matrix Showing Summary of all the Variables**

		Process modeling	Workflow scheduler	Workflow resource allocator	Task accomplishment	Profitability	Quality service-delivery
Process modelling	Pearson Correlation	1	.816**	.503**	.873**	.739**	.894**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	53	53	53	53	53	53
Workflow scheduler	Pearson Correlation	.816**	1	.563**	.847**	.648**	.859**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	53	53	53	53	53	53
Workflow resource allocator	Pearson Correlation	.503**	.563**	1	.891**	.799**	.787**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	53	53	53	53	53	53
Task accomplishment	Pearson Correlation	.873**	.847**	.891**	1	.891**	.888**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	53	53	53	53	53	53
Profitability	Pearson Correlation	.739**	.648**	.799**	.891**	1	.805**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	53	53	53	53	53	53
Quality service-delivery	Pearson Correlation	.894**	.859**	.787**	.888**	.805**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	53	53	53	53	53	53

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

From the correlation matrix on Table 4.24, it can be observed that there is a correlation coefficient of 0.873\*\* between Process modeling and task accomplishment, indicating a very strong and positive relationship between Process modeling and task accomplishment. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong significant relationship between Process modeling and task accomplishment. This further implies that most of the changes in task accomplishment among construction companies in Rivers State are caused by Process modeling while others are caused by externalities; there is a correlation coefficient of 0.739\*\* between Process modeling and profitability, indicating a strong and positive relationship between Process modeling and profitability. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a strong significant relationship between Process modeling and

profitability. This further implies that some of the profitability experienced among construction companies in Rivers State are caused by Process modeling while others are caused by externalities. Also, there is a correlation coefficient of 0.894\*\* between Process modeling and quality service-delivery, indicating a very strong and positive relationship between Process modeling and quality service-delivery. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong, significant relationship between Process modeling and quality service-delivery. This further implies that some of the quality service-delivery achieved among construction companies in Rivers State are caused by Process modeling while others are caused by externalities.

Accordingly, the Table shows a correlation coefficient of 0.847\*\* between workflow scheduler and task accomplishment, indicating a very strong and positive relationship between workflow scheduler and task accomplishment. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong significant relationship between workflow scheduler and task accomplishment. This further implies that most of the changes in task accomplishment among construction companies in Rivers State are caused by workflow scheduler while others are caused by externalities; there is a correlation coefficient of 0.648\*\* between workflow scheduler and profitability, indicating a strong and positive relationship between workflow scheduler and profitability. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a strong significant relationship between workflow scheduler and profitability. This further implies that most of the profitability experienced among construction companies in Rivers State is caused by workflow scheduler while others are caused by externalities. Also, there is a correlation coefficient of 0.859\*\* between workflow scheduler and quality service-delivery, indicating a very strong and positive relationship between workflow scheduler and quality service-delivery. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong significant relationship between workflow scheduler and quality service-delivery. This further implies that most of the quality service-delivery experienced among construction companies in Rivers State are caused by workflow scheduler while others are caused by externalities.

The Table further indicates that there is a correlation coefficient of 0.891\*\* between Workflow resource allocator and task accomplishment, indicating a very strong and positive relationship between Workflow resource allocator and task accomplishment. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong, significant relationship between Workflow resource allocator and task accomplishment. This further implies that some of the changes in task accomplishment among construction companies in Rivers State are caused by Workflow resource allocator while others are caused by externalities; there is a correlation coefficient of 0.799\*\* between Workflow resource allocator and profitability, indicating a strong and positive relationship between Workflow resource allocator and profitability. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a strong significant relationship between Workflow resource allocator and profitability. This further implies that most of the profitability experienced among construction companies in Rivers State is caused by Workflow resource allocator while others are caused by externalities. Also, there is a correlation coefficient of 0.787\*\* between Workflow resource allocator and quality service-delivery, indicating a strong and positive relationship between Workflow resource allocator and quality service-delivery. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a strong significant relationship between Workflow resource allocator and quality service-delivery. This further implies that most of the quality

service-delivery experienced among construction companies in Rivers State is caused by Workflow resource allocator while others are caused by externalities.

Finally, the Table divulged a correlation coefficient of 0.968\*\* on the moderating influence of ICT on the relationship between workflow management system and Organizational productivity, indicating that ICT has a very strong and positive influence on the relationship between workflow management system and Organizational productivity of construction companies in Rivers State. More so, the probability value (0.000) is less than the critical value (0.05), this shows that ICT has a very strong significant influence on the relationship between workflow management system and Organizational productivity of construction companies in Rivers State.

### **FINDINGS OF THE STUDY**

The analysis of the study revealed a correlation coefficient of 0.873\*\* between Process modeling and task accomplishment, indicating a very strong and positive relationship between Process modeling and task accomplishment. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong significant relationship between Process modeling and task accomplishment. The analysis results also revealed a correlation coefficient of 0.739\*\* between Process modeling and profitability, indicating a strong and positive relationship between Process modeling and profitability. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a strong significant relationship between Process modeling and profitability. Further, the study result showed a correlation coefficient of 0.894\*\* between Process modeling and quality service-delivery, indicating a strong and positive relationship between Process modeling and quality service-delivery. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a strong significant relationship between Process modeling and quality service-delivery.

The analysis of the study revealed a correlation coefficient of 0.847\*\* between workflow scheduler and task accomplishment, indicating a very strong and positive relationship between workflow scheduler and task accomplishment. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong significant relationship between workflow scheduler and task accomplishment. The analysis results also revealed a correlation coefficient of 0.648\*\* between workflow scheduler and profitability, indicating a strong and positive relationship between workflow scheduler and profitability. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a strong significant relationship between workflow scheduler and profitability. Further, the study result showed a correlation coefficient of 0.859\*\* between workflow scheduler and quality service-delivery, indicating a very strong and positive relationship between workflow scheduler and quality service-delivery. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong significant relationship between workflow scheduler and quality service-delivery.

### **The Relationship between Workflow resource allocator and Organizational productivity**

The analysis of the study revealed a correlation coefficient of 0.891\*\* between Workflow resource allocator and task accomplishment, indicating a very strong and positive relationship between Workflow resource allocator and task accomplishment. More so, the probability



value (0.000) is less than the critical value (0.05), this shows that there is a very strong significant relationship between Workflow resource allocator and task accomplishment. The analysis results also revealed a correlation coefficient of 0.799\*\* between Workflow resource allocator and profitability, indicating a strong and positive relationship between Workflow resource allocator and profitability. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a strong significant relationship between Workflow resource allocator and profitability. Further, the study result showed a correlation coefficient of 0.787\*\* between Workflow resource allocator and quality service-delivery, indicating a strong and positive relationship between Workflow resource allocator and quality service-delivery. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a strong significant relationship between Workflow resource allocator and quality service-delivery.

### **The Moderating Influence of ICT on the Relationship between Workflow management system and Organizational productivity**

The analysis of the study revealed a regression coefficient of 0.968\*\* on the moderating influence of ICT on the relationship between workflow management system and Organizational productivity, indicating that ICT has a very strong and positive influence on the relationship between workflow management system and Organizational productivity. More so, the probability value (0.000) is less than the critical value (0.05), this shows that ICT has a very strong significant influence on the relationship between workflow management system and Organizational productivity.

The findings of this study are in consonance with the finding of authors in the area of ICT. Specifically, Özçelik, Aybas & Uyargil (2016) whose study on “High performance work system and ICT: Resource-based view considerations” employed the descriptive survey research design and questionnaire method of data collection. Spearman Rank Order Correlation statistical tool was used to measure the study hypotheses and their findings revealed that ICT permeate the ways in which organizations use them to operationalize their organizational culture.

More-so, the findings of this study aligns with the findings of Tamayo & Borges (2006), whose empirical study employed the descriptive survey research design and questionnaire method of data collection. Spearman Rank Order Correlation statistical tool was also used to measure the study hypotheses and their findings revealed that ICT contribute to internal integration, motivate the achievement of goals and objectives and are imperative for organizational effectiveness.

Finally, the findings of this study are in tandem with the findings of Tamayo (1998) whose empirical study revealed that these technologies being talked about are a major determinant of organizational productivity. Thus, makes it a critical player in the attainment of organizational productivity and sustainability.

### **CONCLUSION**

In line with the findings of this study and to the extent of its consistency with results of similar previous studies, we conclude that workflow management system have a positive significant relationship with productivity of construction companies in Rivers State. Thus, workflow management system is a key imperative for task accomplishment and improvement in Organizational productivity within the Rivers State construction sector given its Process

modeling, workflow scheduler and Workflow resource allocator which in turn impacts task accomplishment of the business, profitability among administrators as well as quality service-delivery of the firm.

Based on the analysis of Workflow Management System and its impact on Organizational Productivity of Construction Companies in Rivers State, the following recommendations are proposed to further improve its effectiveness:

1. Managers of construction companies should hold sway on the pivotal role of Process modelling in their operations to ensure their productivity.
2. Managers of construction companies should seek to build strong workflow schedulers in line aimed at increasing productivity and enhancing efficiency.
3. Managers of construction companies should apply objectivity in their Workflow resource allocator processes as this can either ruin or increase their productivity.
4. Managers of construction companies should provide the listed elements mentioned in this study to reciprocate the expectation of managers as they are key to productivity through workflow management system.

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