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Research Philosophy: The Roadmap to Project Management

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ABSTRACT

Purpose: This paper underscores how research philosophy shapes key elements of project management, including methodology selection, data collection, analysis, and interpretation. It highlights that project managers must critically examine their research philosophy and align it with the objectives and nature of their projects. The resulting synergy ensures that projects are grounded in a robust philosophical foundation, enhancing their rigor, relevance, and impact.

Design/ Methodology/Approach: The paper adopted the desktop literature review method. Thus, the paper was purely qualitative, drawing its findings from secondary sources of information.

Findings: This article presents the concept of research philosophy as an essential guide for navigating the complex terrain of project management. It highlights the interdependent connection between research philosophy and project management, underscoring the role of a clearly defined research philosophy in equipping project managers to make educated choices, tackle obstacles, and steer projects toward favorable results. In the end, research philosophy not only influences the research journey but also acts as a guiding principle that directs project managers toward proficient approaches, perceptive evaluations, and valuable contributions to the realm of project management.

Contribution to policy and practice: The paper contributes to the formulation of guidelines and policies that emphasize the integration of research philosophy in project management approaches. Policymakers can consider recommendations derived from the study to establish a framework that encourages project managers to adopt well-defined research philosophies aligned with project objectives. The study sheds light on how specific research philosophies can enhance sustainable project management practices. This insight could influence policy development by promoting the incorporation of sustainable principles into project management strategies. Findings from the research could lead to the development of policies that prioritize research-based risk assessment and mitigation strategies. By recognizing the significance of research philosophy in understanding project risks, policymakers can advocate for its inclusion in project management policy frameworks.

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Introduction to Research Philosophy and its Relevance in Project Management

Research philosophy serves as the fundamental framework that underpins the approach, design, and conduct of research endeavors. It encompasses the fundamental beliefs, assumptions, and paradigms that shape the researcher's perspective and guide their exploration of knowledge. In the realm of project management, research philosophy plays a pivotal role in determining how projects are conceived, planned, executed, and evaluated (Bryman, & Bell, 2015). Understanding the basic concepts of research philosophy is essential for project managers and researchers alike, as it influences the way projects are conceptualized, methodologies are chosen, and outcomes are interpreted (Easterby-Smith, Thorpe & Jackson, 2012).

Basics and Concepts of Research Philosophy

Research philosophy is grounded in a set of interconnected concepts that reflect differing perspectives on the nature of reality, knowledge, and the researcher's role. Three primary research philosophies are often discussed in literature: positivism, interpretivism (or constructivism), and pragmatism. Each philosophy offers a distinct lens through which knowledge is pursued and understood (Saunders, Lewis & Thornhill, 2019).

Positivism: Positivist research philosophy is rooted in the belief that reality is objective, and knowledge can be systematically derived through empirical observation, measurement, and analysis. Positivists seek to uncover universal laws and causal relationships, often employing quantitative methods. In project management, positivism may inform research aimed at identifying best practices, quantifying project success metrics, and predicting project outcomes.

Interpretivism (Constructivism): Interpretivist philosophy contends that reality is subjective and socially constructed, with multiple meanings and interpretations. Researchers adopting this perspective focus on understanding the context, perceptions, and experiences of individuals. In project management, interpretivism can guide studies exploring project stakeholders' perspectives, team dynamics, and the influence of organizational culture on project outcomes.

Pragmatism: Pragmatism bridges the gap between positivism and interpretivism, emphasizing the practical application of research findings. Pragmatist researchers prioritize the usefulness of knowledge and may employ mixed-methods approaches to address research questions. In project management, a pragmatic research philosophy can guide investigations into effective project management strategies that combine quantitative analysis with qualitative insights.

Linking Research Philosophy to Project Management

Research philosophy significantly influences project management by shaping the way projects are planned, executed, and evaluated. The choice of research philosophy informs the selection of methodologies, data collection techniques, and analytical approaches, thereby impacting the quality and relevance of project management insights (Creswell, 2014). For instance: Methodology Selection: A positivist research philosophy may lead to the adoption of structured surveys and

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statistical analysis to quantify project performance indicators, while an interpretivist approach may favor qualitative methods like interviews to understand project team dynamics and stakeholder perspectives. Data Collection: Research philosophy guides the collection of data. Positivists may focus on objective, quantifiable data, such as project schedules and budget metrics. Interpretivists may gather subjective data, like personal narratives from project participants, to understand the human dimension of project management. Analysis and Interpretation: The chosen research philosophy affects how data is analyzed and interpreted. Positivist research tends to emphasize statistical significance and generalizability, while interpretivist research focuses on contextual understanding and rich descriptions.

Research philosophy

(The Effect of Innovation capabilities on entrepreneurial performance among SMEs will be used as an example***)***

A philosophical argument leads a researcher into picking the research design. The philosophical argument represents a vision that influences the technique. The philosophies include positivism or phenomenological (Smith, 2015). According to Sudeshna and Datt (2016) the main purpose of employing an appropriate philosophical approach is to enable the researcher to decide which approach to adopt and why. Strategies and methods will differ with different researchers.

In research philosophy, there are really only two major ways of 'looking at the world'. One view regards the world as largely objective (there is only one truth or a limited number of universal truths) and measurable in terms of the use of numbers. That is the quantitative and the qualitative paradigms respectively. Methodology is the understanding of how reality affects the way we gain knowledge of reality and eventually how we conduct research about reality (Landiyanto, 019).

Taking an objective approach for example, a researcher can seek to establish the influence innovation capabilities have on entrepreneurial performance. This approach involves is usually a descriptive approach describing the outcomes as they are without manipulation. It uses measurable/quantifiable measures of both the independent variable (*Innovation capabilities*) and the dependent variable (*entrepreneurial performance*) as well as the qualitative approach. Quantitative study aims to cover the measurable aspects of the research where data is in a meaningful and simple way to allow simpler interpretation of the data. Qualitative research on the other hand, seeks to qualitative data which helps to draw more information about people within the study area. In this regard, the respondents who are the entrepreneurs are given a chance to expound and give further information regarding the particular question. They can share their unique slice of reality, so that all slices together illustrate the range of variation within the study area. They are advantageous in that they allow the respondent to answer autonomously thus allowing for in depth explanations. In a methodological paradigm, the research will look at the procedures and processes taken with the specific research methods employed to structure the research process that is, in collecting, collating and analyzing the obtained data in order to address the research objectives. In our example, the researcher will specify the type of research suitable for the objectives in question, the population to be surveyed and how to isolate an adequate and

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representative sample, instruments to be used in the field and how the data collected will be sorted analysed and presented for interpretation.

Ontology

Ontology, on the other hand, is concerned with the nature of reality. To a greater extent than epistemological considerations, this raises questions of the assumption's researchers have about the way the world operates and the commitment held to particular views (Gruber, 1993). There are two aspects of ontology, objectivism and subjectivism. Objectivism portrays the position that social entities exist in reality external to social actors concerned with their existence. Subjectivism on the other hand, holds that social phenomena are created from the perceptions and consequent actions of those social actors concerned with their existence. A good example of objectivism is by use of a descriptive research approach where the research phenomenon characteristics are reported the way they are. Thus the innovation capabilities existing among the SMEs in the target area will be analysed from a realistic perspective to investigate what has and is on the actual ground and to see if the available thresholds have been satisfactory with regard to entrepreneurial performance. Subjectivism can be well explained by an experimental design where experiments and manipulations are done on the independent variables to posit the outcomes on the dependent variable.

Epistemology

Epistemology concerns what constitutes acceptable knowledge in a field of study. The key epistemological question is can the approach to the study of the social world, including that of management and business, be the same as the approach to studying the natural sciences? Epistemology entails Realism, Interpretivism and Positivism. **Realism** relates to scientific enquiry with the perspective that what the senses show us as reality is the truth: that objects have an existence independent of the human mind. Thus, the critical realist's position is that our knowledge of reality is a result of social conditioning (Dobson, 2002). For example the researcher may seek to know why the SMEs use expert advertisers to promote their products or why most businesses/companies prefer older people to hold superior jobs compared to young people. This is because the age factor has been acknowledged to correlate with experience.

Interpretivism is an epistemology that advocates that it is necessary for the researcher to understand differences between humans in our role as social actors. This emphasizes the difference between conducting research among people rather than objects such as trucks and computers. Pragmatism argues that the most important determinant of the research philosophy adopted is the research question. Moreover, if the research question does not suggest unambiguously that either a positivist or interpretivist philosophy is adopted this confirms the pragmatist's view that it is perfectly possible to work with both philosophies (Chowdhury, 2014). Pragmatism notes that mixed methods, (both qualitative and quantitative) are possible, and possibly highly appropriate, within one study (Tashakkori & Teddlie, 1998). A good example of such a research will be the researcher to ask the respondents (entrepreneurs of the SMEs) why they practice promotional techniques or why they target the market in the city as opposed to the market in the rural areas.

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This helps the researcher deduce and interpret the reasons why there are many SMEs in urban areas.

Positivism research philosophy adopts the philosophical stance of the natural scientist, that is by working with an observable social reality and that the end product of such research can be law-like generalizations similar to those produced by the physical and natural scientists' (Remenyi et al., 1998). That is, positivism adheres to the view that knowledge gained through observation including measurement, is trustworthy. In positivism the role of the researcher is limited to data collection and interpretation in an objective way. In these types of studies research findings are usually observable and quantifiable and depend on quantifiable observations that lead to statistical analyses (Saunders, 2011; Collins, 2010). Positivism is from logically structured empirical review while phenomenological gives attention to qualitative approach through understanding of how a particular phenomenon is perceived (Saunders, 2011).

Axiology

Axiology is a branch of philosophy that studies judgments about value. It is the process of social enquiry in which the researcher is interested. The role that one's own values play in all stages of the research process is of great importance if one wishes their research results to be credible. Heron (1996) argues that our values are the guiding reason of all human action. He further argues that researchers demonstrate axiological skill by being able to articulate their values as a basis for making judgements about what research they are conducting and how they go about doing it. After all, at all stages in the research process you will be demonstrating your values. For example, choosing one topic rather than another suggests that you think one of the topics is more important. The choice of philosophical approach is a reflection of the values as is the choice of data collection techniques. Thus, for us choosing the e*ffect of Innovation capabilities on entrepreneurial performance among SMEs,* our objective implies that the questions envisaged in the field of entrepreneurship department will be answered by the capabilities related to innovation. In addition, the methods to be employed by the researcher offer positive ground that the objective of the research will be met. Furthermore, to conduct a study where there is great importance placed in data collected through interview work, suggests that the researcher values personal interaction with their respondents more highly than their anonymous views expressed through survey data.

Variables implied and their level of measurement as either quantitative or qualitative.

Dependent Variable (Y) = Completion of doctoral study – qualitative (*Discrete data*)

Independent Variable (X) = Gender of the student – qualitative (*Discrete data*)

Independent Variable (X) = Part-time university lecturer – qualitative (*Discrete data*)

Independent Variable (X) = Age of the student – quantitative (*Continuous data*)

Note: *Continuous data is data that falls in a continuous sequence. Continuous data includes any value within range. Discrete data on the other hand is countable while continuous data is measurable. Discrete data contains distinct or separate values.*

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Analytical models that may be used to study the econometric problem implied.

Logistic regression

Logistic regression $\bar{Y}$ = (1, 0); Where 1 = completion, 0 = non completion.

Therefore the model will be as follows:

Prob (Y) = $\frac{1}{(X1,X2,X3)}$ = $Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta 3 X_3 + e$

Where the odds or probability of Y occurring is calculated as:

e =2.718, $e^{(\beta)}$ = which gives the odds of Occurrence of Y with the change in X and

$Z_i = \beta_0 + \beta_1$ gender$+ \beta_2$ part time$+ \beta_3$ age

β_0 = constant

ln = Logarithm function

$\beta_0, \beta_1, \beta_2, \beta_3$ = coefficient of the variables

X_1, X_2, X_3 = Independent variables (Gender of the student, Part-time university lecturer and Age of the student respectively)

Logit model

$p_i = E(Y) = \bar{Y} = 1/X_i$

$= \left(\frac{1}{1+e^{-Zi}}\right) = \left(\frac{1}{1+e^{-(\beta 0 + \beta' Xi)}}\right)$

Let $Z_i = \beta_0 + \boldsymbol{\beta' X_i}$ (Christensen, 1990), where i is $(i)^{th}$ student

$p_i = \left(\frac{1}{1+e^{-Zi}}\right)$, therefore $e^{Zi} = \left(\frac{Zi}{1+e^{Zi}}\right)$, Thus, $p_i = F(Z_i)$

$e^{Zi} = \left(\frac{pi}{1-pi}\right)$

The logarithm **LOGIT**:

$$\ln\left(\frac{pi}{1-pi}\right) = Z_i = Z_i = \beta_0 + \boldsymbol{\beta' X_i}$$

To estimate the unknown parameters of the LOGIT model we can't use classical method of least squares, but with quality software we can use the maximum likelihood method. From the common formula of the log-likelihood function, specified e.g. by Christensen (1990):

In L $(\beta_0, \boldsymbol{\beta})$ =

$$\sum_{i=1}^{N} [Compl_{3i} \ln\left(\frac{e^{\beta 0 + \boldsymbol{\beta' Xi}}}{(1 + e^{\beta 0 + \boldsymbol{\beta' Xi}})}\right) + 1 - \bar{Y} \ln\left(\frac{e^{\beta 0 + \boldsymbol{\beta' Xi}}}{(1 + e^{\beta 0 + \boldsymbol{\beta' Xi}})}\right)$$

In L $(\beta_0, \beta_1, \beta_2, \beta_3)$

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$$\sum_{i=1}^{N}[\text{Compl}_{3i} \ln\left(\frac{e^{(\beta 0 + \beta 1\ GENDER, + \beta 2\ PART\ TIME, + \beta 3AGE)}}{(1 + e^{(\beta 0 + \beta 1\ GENDER, + \beta 2\ PART\ TIME, + \beta 3AGE)})}\right)) +$$

$$1 - \text{Compl\_3i}\ \text{l} \ln\left(\frac{e^{(\beta 0 + \beta 1\ GENDER, + \beta 2\ PART\ TIME, + \beta 3AGE)}}{(1 + e^{(\beta 0 + \beta 1\ GENDER, + \beta 2\ PART\ TIME, + \beta 3AGE)})}\right)]$$

The idea is similar to Probit regression except that a different Cumulative Distribution Function (CDF) is used

Probit model

Probit regression, (probit model), is used to predict dichotomous or binary outcome variables. In the probit model, the inverse standard normal distribution of the probability is modeled as a linear combination of the predictors (Long, 1997). To estimate the unknown parameters of the PROBIT model we cannot use classical methods of least squares either, but we can use a universal maximum likelihood method. From the common formula of the log- likelihood function, specified e.g. by Christensen (1990):

$p_i = E(Y) = \bar{Y} = 1/X_i$

$= \Phi^{-1}(p_i)$

In L $(\beta_0, \boldsymbol{\beta})$ =

$$\sum_{i=1}^{N}[\bar{Y} \ln (F(\beta 0 + \beta' Xi)) + (1 - \bar{Y}) \ln (1 - (F(\beta 0 + \beta 0 + \beta' Xi))]$$

In L $(\beta_0, \beta_1, \beta_2, \beta_3)$ =

$$\sum_{i=1}^{N}[\text{Compl}_{3i} \ln (F(\beta 0 + \beta 1\ GENDER, + \beta 2\ PART\ TIME, + \beta 3AGE)) +$$

$$\text{Compl\_3i} \ln (1 - (F(\beta 0 + \beta 1\ GENDER, + \beta 2\ PART\ TIME, + \beta 3AGE))]$$

Where:

E(Y) or $\bar{Y}$ = Estimated outcome (Completion of doctoral study: 1 - the student will complete the doctoral study in three years, 0 - the student will complete the doctoral study in three years)

β_0 = constant

ln = Logarithm function

$\beta_0, \beta_1, \beta_2, \beta_3$ = coefficient of the variables

X_1 = Gender of the student

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X_2 = Part-time university lecturer

X_3 = Age of the student

(a) **S**uppose 50 students with the following characteristics are studied.

Male	20
Female	30
Part-time	30
Not part-time Lecturer	20
Age of student	Number
30	10
35	12
40	10
42	8

Explain how you would proceed to predict whether a student will complete his/her Ph.D. in three years (36 months)

Suppose the table is re-arranged as follows:

gender	**Part-time**	**Age**	**Completing/not completing**
0	1	30	1
1	1	30	0
1	0	30	1
1	1	30	0
0	1	30	1

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1	0	30	1
1	1	30	1
0	1	30	1
0	1	30	1
0	1	35	0
0	0	35	1
0	0	35	0
1	1	35	1
0	0	35	1
1	1	35	1
0	1	35	1
1	1	35	1
1	0	35	0
0	1	35	0
0	1	35	0

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1	1	35	1
1	1	40	0
0	1	40	1
0	1	40	0
0	1	40	1
0	1	40	0
0	0	40	1
0	1	40	0
0	1	40	0
0	0	40	1
1	0	40	0
0	0	42	1
0	0	42	1
0	0	42	1
0	1	42	0

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1	0	42	1
0	1	42	0
1	1	42	1
0	0	42	1
0	1		0
1	0		0
0	1		0
0	0		1
0	0		0
1	1		1
1	1		0
1	0		1
0	0		1
1	1		0
1	0		1

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The approach to this model is best used by a logistic regression. The model will bear the following regression model:

Variables	**β**	**Sig.**	**Exp(B)**
Gender	0.02	0.978	1.021
Part-time	1.465	0.072	4.327
Age	-0.099	0.246	0.906
Constant	3.629	0.230	37.667

The first category was used as a reference category

a Variable(s) entered on step 1: gender, Part-time, Age.

Logistic regression $\bar{Y}$ = (1, 0); Where 1 = completion, 0 = non completion.

Therefore the model will be as follows:

Prob (Y) = $\frac{1}{(X1,X2,X3)}$ = $Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta 3 X_3 + e$

Since, $p_i = F(Z_i)$

$\left(\frac{1}{1+e^{-Zi}}\right)$, therefore $e^{Zi} = \left(\frac{Zi}{1+e^{Zi}}\right)$,

$Z_i = \beta_0 + \mathbf{\beta' X_i}$,

Where the odds or probability of Y occurring is calculated as:

i = $(i)^{th}$ student

e =2.718, $e^{(\beta)}$ = which gives the odds of Occurrence of Y with the change in X and

Exp (B) which is the Odds ratio = $\left(\text{pi} = \left(\frac{OR}{1+OR}\right)\right)$ $OR\left(e^{Zi} = \left(\frac{Zi}{1+e^{Zi}}\right)\right)$,

$Z_i = \beta_0 + \beta_1$ gender$+ \beta_2$ part time$+ \beta_3$ age

β_0 = constant

ln = Logarithm function

$\beta_0, \beta_1, \beta_2, \beta_3$ = coefficient of the variables

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X_1, X_2, X_3 = Independent variables (Gender of the student, Part-time university lecturer and Age of the student respectively).

Variables	**β**	**Sig.**	**Exp(B)**
Gender	0.02	0.978	1.021
Part-time	1.465	0.072	4.327
Age	-0.099	0.246	0.906
Constant	3.629	0.230	37.667

Given the variable gender, the probability of a student completing his/her Ph.D in three years increases by 1.021 times (units). This model shows that there is a 50.51% probability that a student will complete his/her Ph.D in three years if the student is a male as compared to a female student. The relationship is however not statistically significant (p> 005 =.978).

$$\text{Exp (B) = Odds ratio} = \left(\text{Pi} = \left(\frac{\text{OR}}{1+\text{OR}}\right)\right) = \left(\text{Pi} = \left(\frac{1.021}{1+1.021}\right)\right) = 0.5051$$

Given the variable part time lecturing, the chances/odds of Y is 1.465. This implies that the probability of a student completing his/her Ph.D in three years increases by 1.465 units. That is, there is a 59.43% probability that a student will complete his/her Ph.D in three years if the student is a part time lecturer. The relationship is however not statistically significant.

$$\text{Exp (B) = Odds ratio} = \left(\text{Pi} = \left(\frac{\text{OR}}{1+\text{OR}}\right)\right) = \left(\text{Pi} = \left(\frac{1.465}{1+1.465}\right)\right) = 0.5943$$

Given the variable age, the chances/odds of Y (the probability of a student completing his/her Ph.D in three years) is 0.906. This implies that the probability of a student completing his/her Ph.D in three years decreases by 0.906 units (*the Odds ratio will be interpreted since the variable is continuous)*. There is a 9.4% probability that a student will complete his/her Ph.D in three years (1-0.906). That is the likelihood of a student completing his/her Ph.D in three years decreases by 0.906 units as the age of the student increases. The relationship is however not statistically significant.

N/B: *In continuous variables, the Odds ratio are interpreted while in discrete data the probability is useful.*

(c) When can we use Probit instead of Logit in analyzing data

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The difference between Logistic and Probit models lies in this assumption about the distribution of the errors (Christensen, 1990). Logit model uses Standard logistic distribution of errors while Probit model uses Normal distribution of errors (Simpach, 2012).

In Probit regression, the cumulative standard normal distribution function $\Phi(\cdot)$ $\Phi(\cdot)$ is used to model the regression function when the dependent variable is binary, that is, we assume:

$p_i = E(Y) = \bar{Y} = 1/X_i$

$= \Phi^{-1}(p_i)$

Prob (Y) = $\frac{1}{(X1,X2,X3)}$ = $Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta 3 X_3 + e$

Logit model uses Standard logistic distribution of errors that is it is the CDF of a standard logistically distributed random variable.

$p_i = E(Y) = \bar{Y} = 1/X_i$

$= \left(\frac{1}{1+e^{-Zi}}\right) = \left(\frac{1}{1+e^{-(\beta 0 + \beta' Xi)}}\right)$

Let $Z_i = \beta_0 + \mathbf{\beta' X_i}$ (Christensen, 1990), where i is (i) th student

It has been suggested that the rate of poverty in three cities A, B and C may be as a result of the level of education, age and income levels. Suppose that you would like to determine whether the rate of poverty is different in the three cities A, B and C and you collect data on poverty and on the other variables in each of the cities.

(a) Write the functional specification and model that you would use to solve this problem with regard to determination of whether poverty levels vary across cities

Logistic regression $\bar{Y}$ = (1, 0); Where 1 = Poor, 0 = Not poor.

Therefore the model will be as follows:

Prob (Y) = $\frac{1}{(X1,X2,X3)}$ = $Z_i = \beta_0 + \beta_1 X_1 + e$

Where the odds or probability of Y occurring is calculated as:

e =2.718, $e^{(\beta)}$ = which gives the odds of Occurrence of Y with the change in X and

Prob (Y) = $Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta 3 X_3 + e$

β_0 = constant

$\beta_0, \beta_1,$ = coefficient of the variables

X_1, X_2, X_3 = Independent variables (City A, City B and City C respectively)

(b) What analytical models would you use? Why?

The model will be specified as follows:

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$\bar{Y}$ = (1, 0); Where 1 = completion, 0 = non completion.

Therefore the model will be as follows:

$$\text{Prob (Y)}_{\text{(City A, B, C)}} = \frac{1}{(X1,X2,X3)} = Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta 3 X_3 + e$$

Where Prob $Y_{\text{(City A, B, C)}}$) = the rate of poverty in three cities A, B and C calculated as:

Prob $Y_{\text{(City A, B, C)}}$) = $Z_i = \beta_0 + \beta_1$ education + β_2 age + β_3 income levels

β_0 = constant

ln = Logarithm function

$\beta_0, \beta_1, \beta_2, \beta_3$ = coefficient of the variables

X_1, X_2, X_3 = Independent variables (level of education, age and income levels respectively)

The analytical model to be used will be the binary logistic regression since the outcome of the model is a discrete/dichotomous variable (with only two possible outcomes- either poor or not poor). Poverty is a measure of comparing a person's or family's income to a set poverty threshold or minimum amount of income needed to cover basic needs (Above which, the individual is considered not poor and below which the individual is poor).

The binary logistic regression can either be a probit model or a logit model depending on the assumption about the distribution of the errors (Christensen, 1990). Logit model uses Standard logistic distribution of errors while Probit model uses Normal distribution of errors.

(c) How would you interpret the results of a suitable regression between poverty predictors and the city where the criminals reside?

(d) The linear probability regression model will be as follows:

$$\text{Prob (Y)} = \frac{1}{(X1,X2,X3)} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta 3 X_3 + e$$

Prob $(Y_{\text{poverty}}) = \beta_0 + \beta_1$ education + β_2 age + β_3 income levels

Prob $(Y_{\text{Crime rate}}) = \beta_0 + \beta_1$ Poverty

Thus, Prob $(Y_{\text{Crime rate}}) = \beta_0 + \beta_1$ education + β_2 age + β_3 income levels + β_4 (Z)

Where $Z = \left(\frac{(\text{education} + \text{age} + \text{income levels})}{3}\right) * Poverty$

(e) How many independent and dependent variables do you consider to be in model that would include all predictors of poverty in the given situation? Name them and indicate how they would be coded.

In a linear probability regression model as follows;

$$\text{Prob (Y)} = \frac{1}{(X1,X2,X3)} = \beta_0 + \boldsymbol{\beta_1 X_i} + e$$

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Where;

Y = rate of poverty

$\mathbf{X_i}$ = predictor variables

Variable	**Type of variable**	**Code**
Rate of poverty	The dependent	(Poor=0 Not poor=1)
Gender	Independent	(Female=0 Male=1)
Education	Independent	(Informal=0 Formal=1)
Income levels	Independent	(Continuous variable)
Marital status	Independent	(Not married=0 Married=1)
Age	Independent	(Continuous variable)
Income-to-Needs Ratio	Independent	(low=0 High=1)
Religion	Independent	(Continuous variable)
Household size	Independent	(Continuous variable)
Employment	Independent	(Not employed=0 employed=1)
Local government service delivery	Independent	(Poor service delivery=0 good service delivery=1)

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Place of residence (Continuous variable)	Independent	(Continuous variable)
Crime rate	Independent	(low=0 High=1)

(Meyer, 2016; Brown & Males, 2011; Ratcliffe & Kalish, 2017; Cheteni, 2018).

(f) What would be the government policy implications for the results obtained from this study?

(g) Based on the above predictor variables identified above the following are the policy recommendations:

The government is recommended to enforce the 1/3 gender rule and an inclusive policy to ensure female improve their economic capacity. This can be done by the government ensuring that offices adhere to the policy not only by employing women but also including them into high position especially in government offices. Education by the government needs to be intensified across all people and gender in the country. This is considered the first step to empowerment of the citizen especially in the marginalized areas such as Turkana, Wajir, etc.

Kenya's minimum wage rate which was last reviewed in 2015 should be reviewed in order to hit the expected Minimum Wages in Kenya at 14300.00 KES/Month. This will help elevate the economic standards of living by improving the economic capacity of the employed workers. Likewise, taxation of products is needs to be done intelligently in order to avoid over-burdening the poor. Thus the government should lessen its tax policies on basic products and seeks alternative ways and channels of revenue collection. This would improve the Income-to-Needs Ratio.

Since it has been noted that crime rate is a derivative of poverty rate in a given economy/city or county, the government needs to intensify the strategies to counter the problem since it is a negative factor to development. For example the Nyumba Kumi initiative has proved to be a factor to ensure that the community itself is self-sustainable security-wise. To a greater extent, crime rate can worsen the rate of poverty and as such the government is recommended through the central government to help the youth generate employment by opening employment channels and providing the necessary resources for development.

Conclusion

In conclusion, this paper positions research philosophy as an indispensable roadmap for navigating the intricate landscape of project management. It illuminates the symbiotic relationship between research philosophy and project management, emphasizing how a well-defined research philosophy can empower project managers to make informed decisions, address challenges, and propel projects toward successful outcomes. Ultimately, research philosophy not only shapes the

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research process but serves as a compass that guides project managers toward effective strategies, insightful analyses, and meaningful contributions to the field of project management.

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