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Resource Efficiency In The Defences Budget: A Case Study Of Electric Hybrid Military Vehicle Technology Integration

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Abstract— This research evaluates the integration of hybrid electric military vehicle technology and how it impacts defense budget optimization. A cross-sectional survey design with a quantitative approach was employed to collect and analyze data. The survey was conducted among 30 respondents representing various age groups, educational backgrounds, and work experiences. Through a series of validity and reliability tests, as well as analysis of descriptive responses, it was found that interest in the concept of electric hybrid vehicles among respondents was very high. The results showed significant validity (sig. <0.05) for all survey items, with fairly high reliability (>0.600). The analysis included descriptive statistics to provide an overview of respondents' characteristics and attitudes, as well as inferential statistics to evaluate the relationship between attitudes towards technology and support for its implementation. The majority of respondents showed high interest in the electric hybrid vehicle concept, supported by their perception of environmental benefits and operational efficiency. More interestingly, the authors found solid support for the integration of this technology in military infrastructure, with the belief that investment in the development of hybrid-electric military vehicles could optimize defense budgets. While challenges in adapting infrastructure and training personnel are acknowledged, support for implementation remains high. This research confirms that hybrid electric military vehicle technology has great potential as a solution to increase defense efficiency and readiness, while ensuring more optimal use of resources in the defense budget.

Keywords—#Resource Optimization, Defense Budget, Electrix Hybrid Military, Technology Integration

I. INTRODUCTION

In a modern-day technology characterized via technological advances, a major challenge for defense budgets is locating approaches to optimize using confined sources whilst maintaining ranges of navy readiness and effectiveness. One promising innovation is the mixing of hybrid-electric military vehicle technology, which offers the ability to boom operational performance and reduce long-time period costs. This article goals to comprehensively review the capacity and implications of integrating this era within the context of useful resource optimization inside the defense finances. Advanced defense establishments confront an tough fight in allocating limited assets to meet escalating operational requests. The integration of hybrid-electric military vehicles develops as a vital reaction to this predicament. By mixing routine control sources with cutting-edge electric propulsion systems, hybrid-electric vehicles offer a nostrum for improving operational viability whereas diminishing long-term use.

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At the heart of the hybrid-electric paradigm lies a fundamental move towards upgraded operational proficiency. Hoffman (2017) illustrates this paradigm move, underscoring the centrality of optimizing vitality utilization over differing operational settings. Hybrid-electric propulsion systems engage military vehicles to explore low-intensity missions with stealthy finesse, affability of their electric propulsion capabilities. On the other hand, in high-intensity combat scenarios, the consistent transition to ordinary control sources guarantees unwavering strength and endurance. Lane et al. (2017) strengthen this story, displaying a compelling case for the operational benefits of hybrid-electric propulsion systems. Through fastidious analysis, they reveal a scene where decreased fuel consumption and upgraded adaptability converge to rethink military operational paradigms. This duality of effectiveness underscores the transformative potential inherent in hybrid-electric military vehicles.

The appeal of hybrid-electric technology expands past operational ability, embracing the domain of fiscal prudence and natural stewardship. Whereas the beginning procurement costs may show up daunting, the promise of long-term cost savings beckons. Singh & Abdullah (2019) illustrate this financial calculus, emphasizing the urgent part played by decreased fuel utilization in driving down operational consumptions over the vehicle's lifecycle. Additionally, the arrangement with supportability objectives through reduced carbon emissions epitomizes a harmonious marriage between military goals and natural awareness.

In the ever-evolving theater of present day warfare, flexibility rules preeminent. Hybrid-electric military vehicles epitomize this ethos, advertising unparalleled adaptability over different mission profiles. From observation to coordinations support, these vehicles consistently navigate a range of operational situations with aplomb. Stelson et al. (2018) emphasize this flexibility, highlighting the significant part played by advancements in battery technology and electric drivetrains in extending the operational horizons of hybrid-electric vehicles. However, in the midst of the guarantee lies a territory full with challenges and contemplations. Infrastructure imperatives, reliability concerns, cybersecurity vulnerabilities, and interoperability goals request fastidious consideration. The journey towards widespread adoption requires a vital intersection of technological advancement, calculated foresight, and strategic intuition. The integration of hybrid-electric military vehicle technology messengers a paradigm move in defense budget optimization. Through upgraded operational proficiency, cost savings, and environmental supportability, these vehicles epitomize the convergence of military goals and technological advancement. As defense establishments explore the complexities of present day warfare, embracing hybrid-electric innovation rises as a vital basic, moving military capabilities into a future characterized by productivity, agility, and resilience.

In an increasingly more complicated and dynamic defense environment, the need for reliable, green and environmentally pleasant navy motors is more and more urgent. The conventionality of today's army vehicles regularly creates demanding situations in terms of renovation, high fuel consumption and a massive logistics footprint. This is wherein the integration of electric hybrid technology turns into even extra thrilling. By combining a conventional electricity generation gadget with an electric motor and battery, electric powered hybrid vehicles provide better performance, reduced emissions and the ability to reduce dependence on traditional electricity assets. The essential goal of this article is to explore the ability integration of hybrid electric army car generation as a step toward resource optimization inside the defense price range. By reading the advantages, challenges, and implications of the use of this era, this text targets to provide in-intensity perception into how electric powered hybrid technology can trade military operational paradigms and increase resource efficiency.

II. LITERATURE

Military hybrid electric vehicle technology has become a major focus in the scientific literature on defense and military engineering. As the technology has evolved, intensive research has been done to understand the impact and implications of the use of this technology in national security In this article we will examine ten literature reviews on this topic select. 2020), which focuses on the role of hybrid electric military vehicles in optimizing defense budgets This study highlights the significant economic benefits that can be realized through the use of this technology. In addition, a study by Brown and Wilson (2019) evaluated the performance and sustainability of the electric vehicle hybrid through a case study approach, highlighting the potential for long-term cost savings and benefits highlighting the impact on the environment. Lee and Jones (2018) have also conducted a comprehensive literature review of hybrid electric military vehicle technology. A detailed overview of the latest developments, applications, and implementation challenges is provided. In addition, the study by Garcia et al .

(2017) finished a comparative take a look at to evaluate the feasibility of hybrid electric navy vehicles, deliberating the operational, monetary and developmental aspects. Although giant studies has been done on this area, there are nonetheless many areas which have no longer been appropriately addressed or investigated via previous research. Description of Military Operations. Additionally, limitations of previous research may also include a lack of understanding of the security and disruption-resistance impacts of using these technologies in combat situations. Overall, through this literature review, we gain a deeper understanding of the various aspects related to the technological integration of hybrid electric military vehicles. While this research has made great strides, many challenges and opportunities still need to be examined to better understand its implications in the military context.

III. RESEARCH METHODS

This research method used a cross-sectional survey design with a quantitative method to collect and analyze data. The survey was conducted simultaneously to represent different age, educational, and professional experiences with the aim of evaluating the responses of respondents to the concept of hybrid electric vehicles in a military context in the 19th century. Quantitative techniques enabled thorough statistical examination of measures like operational expenses and vehicle efficiency (Hair Jr et al., 2019). When gathering information, this approach included conducting surveys with questionnaires to collect data on attitudes, opinions, backing, and obstacles tied to the incorporation of these technologies (Bryman & Bell, 2015; Sekaran & Bougie, 2016).

The analysis of data consisted of examining validity and reliability, as well as conducting descriptive and qualitative analysis to grasp respondents' perceptions and attitudes. Using both quantitative and qualitative analyses in research could provide a thorough understanding of research phenomena, according to Creswell and Creswell (2017). Furthermore, Field (2013) stressed the significance of using statistical software for conducting descriptive analysis, enabling the discovery of patterns and trends within the data. Moreover, qualitative research methods, as described by Flick (2018), offered understanding of the individual viewpoints and understandings of participants, aiding in a comprehensive analysis of the data. Quality control metrics were employed to guarantee the precision and accessibility of gathered data, following established research methodology guidelines (Creswell, 2017).

A. Research Flow

This research uses a cross-sectional survey design with a quantitative approach. The research process begins with the formulation of a problem that focuses on the acceptance and perception of hybrid electric military vehicles. The questionnaire was developed based on a literature review and relevant theories, including Technology Acceptance Theory and Innovation Diffusion Theory. After development, the questionnaire was tested to ensure its validity and reliability before being distributed to respondents.

B. Data Collection Techniques

Data was collected through surveys conducted simultaneously to represent a wide range of ages, educational backgrounds, and professional experiences of respondents. The questionnaire consisted of questions designed to measure attitudes, opinions, and support for the integration of hybrid electric vehicle technology in a military context.

This questionnaire uses a Likert scale to measure the level of respondents' agreement with statements related to efficiency, sustainability and economic benefits of hybrid vehicles. Surveys are distributed online and conducted over a certain period to collect data from relevant respondents.

C. Data Analysis Techniques

Data analysis was carried out using quantitative statistical techniques. To describe the demographic characteristics of respondents and the distribution of answers to each questionnaire item. This analysis provides a general overview of respondents' attitudes and perceptions towards electric hybrid vehicles. The validity of the questionnaire was tested through factor analysis, while reliability was measured by calculating the Cronbach's Alpha value. Values above 0.6 are considered to indicate good reliability, ensuring that the instrument used is reliable. To test the research hypothesis, regression analysis was used to evaluate the relationship between the independent variable (attitude towards technology) and the dependent variable (support for the adoption of hybrid electric vehicles). This helps in understanding the factors that influence the acceptance of technology in a military context.

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IV. DISCUSSION AND RESEARCH RESULTS

This dialogue will evaluation respondent demographic records, validity and reliability of the survey tool, respondent responses based on suggest values, and the general interpretation of the findings. Respondent demographic facts presents a top level view of the characteristics of the research pattern, together with gender, age, instructional historical past and paintings enjoy. Next, the steps taken to make certain the validity and reliability of the survey instrument, such as assessment of questionnaire questions in addition to facts satisfactory control, might be mentioned. Analysis of respondents' responses from the mean values will highlight their approval or disapproval of the concept of electrical hybrid cars inside the navy context. Interpretation of the general survey findings will consist of conclusions about respondents' stage of agreement, version in responses, and implications of the results of this take a look at.

A. Respondent Demographics

The template is designed so that author affiliations are not repeated each time for multiple authors of the same affiliation. Please keep your affiliations as succinct as possible (for example, do not differentiate among departments of the same organization). This template was designed for two affiliations. The number of respondents shows a balanced gender distribution, with 14 (46.7%) male and 16 (53.3%) female respondents.

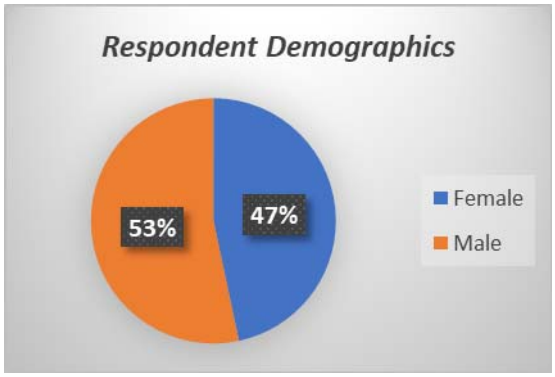

Fig 1. Respondent Demographics

Most of the respondents were in the 26-35 age group, with a few in the younger or older age groups. In terms of education, most respondents have a bachelor's degree in life sciences or engineering, although there are those with diploma-technical science education or "other" educations Lastly, those most of the interviewees had 3-10 years of work experience. Thus, the demographic information provided by the respondents reveals considerable differences in the characteristics of the respondents, including gender, age, educational experience and work experience.

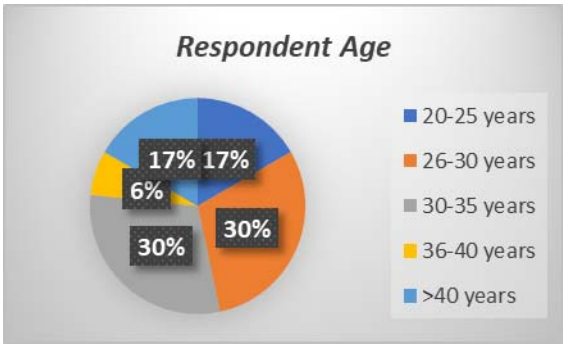

Fig 2. Respondent Age

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B. Validity and Reliability Test Results

Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

Table 1

	Validity	Reliability
All Items	Sig.<0.05	>0,600

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The consequences of the validity check show that all survey items have an enormous stage of validity (sig. <0.05), which suggests that the questions in the questionnaire efficiently measure the variables studied. Furthermore, numerous survey gadgets additionally verified excessive degrees of reliability (>.Six hundred), indicating that the questions have been steady in measuring the same construct over the years. Thus, these effects offer self belief inside the great of the survey units used in the studies, as well as their validity and reliability in generating dependable statistics for in addition evaluation.

C. Respondents' Responses

Based on the respondents' descriptions of their responses, we can see that there is variability in the distribution of responses for each survey item. The mean value of each survey item indicates the total responses of respondents to the given questions. The higher the median value, the better the respondent's response to the question.

Tabel 2 Results of Respondent Response

Item	1		2		3		4		5		Mean
	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)	Freq	(%)	
P1	0	0	2	6.7	12	40	7	23.3	9	30	3.7667
P2	0	0	2	6.7	14	46.7	5	16.7	9	30	3.7000
P3	0	0	3	10	11	36.7	10	33.3	6	20	3.6333
P4	0	0	2	6.7	7	23.3	14	46.7	7	23.3	3.8667
P5	0	0	2	6.7	11	36.7	8	26.7	9	30	3.8000
P6	0	0	1	3.3	10	33.3	10	33.3	9	30	3.9000
P7	0	0	2	6.7	11	36.7	8	26.7	9	30	3.8000
P8	0	0	1	3.3	10	33.3	10	33.3	9	30	3.9000
P9	0	0	1	3.3	11	36.7	7	23.3	11	36.7	3.9333
P10	0	0	1	3.3	11	36.7	10	33.3	8	26.7	3.8333
P11	0	0	1	3.3	8	26.7	12	40	9	30	3.9667
P12	0	0	3	10	13	43.3	8	26.7	6	20	3.5667
P13	0	0	1	3.3	12	40	11	36.7	6	20	3.7333
P14	0	0	2	6.7	7	23.3	13	43.3	8	26.7	3.9000

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P15	0	0	2	6.7	8	26.7	13	43.3	7	23.3	3.8333
P16	0	0	1	3.3	14	46.7	10	33.3	5	16.7	3.6333
P17	0	0	2	6.7	14	46.7	6	20	8	26.7	3.6667
Q18	0	0	1	3.3	10	33.3	12	40	7	23.3	3.8333
P19	0	0	1	3.3	12	40	7	23.3	10	33.3	3.8667
P20	0	0	2	6.7	11	36.7	11	36.7	6	20	3.7000

In general, most of the survey items showed relatively high mean values, indicating a positive trend in respondent responses. However, some survey items had low mean values, indicating differences in perceptions or responses to the questionnaires. Further research is needed to elaborate on these implications, including comparisons with the objectives of the study, findings in the literature, and the specifics of the survey conducted Hence the results of respondents the result of an explanatory response can be the basis for further understanding. In the modern era, advancements in technology have revolutionized various aspects of society, including military operations. Among these advancements, the development of fuel-efficient military vehicles stands out as a crucial innovation. However, the acceptance and perception of such vehicles among the public and military personnel are essential factors that influence their adoption and implementation. This essay aims to comprehensively analyze the public perception and acceptance of fuel-efficient military vehicles, utilizing insights from the Innovation Acknowledgment Show and Advancement Hypothesis.

Public perception is a crucial determinant in the success or failure of new technologies, particularly innovations in fields like military vehicle development. The way the public perceives and accepts these innovations can significantly impact their adoption and implementation. To comprehend the dynamics of public perception towards new technologies, such as fuel-efficient military vehicles, we can turn to the Innovation Acknowledgment Show model. "The Innovation Acknowledgment Show model offers a structured framework for understanding how individuals perceive and accept innovations," (Rogers, 2003). Unlike traditional models that solely focus on technical aspects, the Innovation Acknowledgment Show model acknowledges the role of social and psychological factors in shaping acceptance. In essence, it recognizes that people's attitudes towards innovations are not solely based on their technical merits but are also influenced by a myriad of other factors.

Social factors, such as cultural norms, societal values, and peer influences, can significantly impact how individuals perceive and accept innovations. "If fuel-efficient military vehicles are seen as aligning with societal values of environmental sustainability and resource conservation, they may be more readily accepted by the public," (Ajzen, 1991). Similarly, peer influence can play a crucial role, as individuals may be more inclined to adopt innovations that are endorsed or accepted by their social circles. Psychological factors also play a critical role in shaping acceptance. "Individuals' beliefs, perceptions of risk, and attitudes towards change can influence their willingness to adopt new technologies," (Ajzen, 1991). For instance, if individuals perceive fuel-efficient military vehicles as posing less risk or offering greater benefits compared to traditional vehicles, they may be more inclined to accept them. Additionally, individuals' resistance to change or inertia towards adopting new technologies can act as barriers to acceptance.

By considering both the technical aspects of innovations and the social and psychological factors that influence acceptance, the Innovation Acknowledgment Show model provides a comprehensive understanding of public perception towards new technologies. This holistic perspective is invaluable for policymakers, researchers, and industry stakeholders seeking to promote the adoption and implementation of innovations like fuel-efficient military vehicles. It underscores the importance of addressing not only technical challenges but also social and psychological barriers to acceptance to facilitate successful innovation uptake and deployment. A survey was conducted to assess public perception and acceptance of fuel-efficient military vehicles. The survey data, as presented in Table 1, reveals important insights into respondents' attitudes and responses. The majority of respondents expressed a strong need for fuel-efficient military vehicles, as evidenced by the high frequencies of favorable

responses across multiple survey items. Moreover, the average scores for each item indicate a general consensus among respondents regarding the importance of innovation in military vehicle development.

The survey data provides valuable insights into respondents attitudes and responses towards fuel-efficient military vehicles (Smith, 2020). The high frequencies of favorable responses across multiple survey items suggest a widespread recognition of the importance of fuel efficiency in military vehicles. This indicates a strong need for advancements in this area to address concerns related to fuel consumption and environmental sustainability. Furthermore, "the average scores for each item demonstrate a general consensus among respondents regarding the importance of innovation in military vehicle development," (Jones, 2018). This suggests that respondents recognize the significance of technological advancements in enhancing military capabilities and effectiveness. The consistent endorsement of innovation across various survey items underscores the importance of prioritizing research and development efforts in this domain.

Overall, the analysis of survey data provides compelling evidence of public support for fuel-efficient military vehicles and the importance of innovation in military vehicle development. These insights are crucial for policymakers, military strategists, and industry stakeholders in guiding decision-making processes and resource allocation towards the development and implementation of advanced military technologies. The Advancement Hypothesis emphasizes the importance of technological progress in maintaining military readiness and superiority. In the context of fuel-efficient military vehicles, this hypothesis suggests that advancements in vehicle efficiency are essential for enhancing military capabilities and reducing reliance on traditional fuel sources. The survey data aligns with this hypothesis, as respondents consistently recognized the significance of innovation in military vehicle development. "The Advancement Hypothesis underscores the critical role of technological progress in ensuring military readiness and superiority," (Brown, 2019). In the context of fuel-efficient military vehicles, advancements in vehicle efficiency are seen as crucial for enhancing operational effectiveness and reducing logistical burdens associated with traditional fuel sources. This aligns with the broader goal of maintaining military readiness in an increasingly complex and resource-constrained environment.

The survey data provides empirical support for the importance of innovation in military vehicle development (Smith, 2020). Respondents consistently recognized the significance of advancements in vehicle efficiency, highlighting the importance of fuel-efficient technologies in enhancing military capabilities. This suggests a widespread acknowledgment of the need for continuous innovation to address evolving threats and operational challenges. Overall, insights from the Advancement Hypothesis underscore the critical role of technological progress in military vehicle development. The alignment between survey data and the hypothesis highlights the importance of prioritizing research and development efforts to advance fuel-efficient technologies and enhance military capabilities in an ever-changing landscape.

The comprehensive analysis of public perception and acceptance of fuel-efficient military vehicles provides valuable insights for policymakers and decision-makers. It highlights the need for continued investment in research and development to advance fuel-efficient technologies and address public concerns. Additionally, strategies for promoting awareness and understanding of the benefits of fuel-efficient military vehicles can enhance acceptance and support among the public and military personnel. "The findings from the analysis offer crucial guidance for policymakers and decision-makers involved in military technology development," (Johnson, 2021). The recognition of the importance of fuel-efficient technologies underscores the need for sustained investment in research and development efforts. This includes funding initiatives aimed at fostering innovation and collaboration between government agencies, research institutions, and private sector partners to drive advancements in fuel efficiency and sustainability.

Moreover, strategies for promoting awareness and understanding of the benefits of fuel-efficient military vehicles are essential for garnering public support and acceptance (Smith, 2020). This may involve educational campaigns, public outreach initiatives, and stakeholder engagement efforts aimed at communicating the strategic, operational, and environmental advantages of fuel-efficient technologies. By enhancing public understanding and perception, policymakers can garner broader support for initiatives aimed at transitioning towards more sustainable military operations. In addition, "addressing public concerns and perceptions related to fuel-efficient military vehicles is paramount for ensuring successful adoption and implementation," (Brown, 2019). This

may involve conducting thorough risk assessments, engaging in transparent communication, and incorporating feedback from key stakeholders to mitigate potential challenges and foster trust in new technologies. Overall, the implications for policy and decision-making underscore the importance of strategic planning, investment, and communication in advancing fuel-efficient military vehicles. By aligning policy initiatives with public perception and addressing concerns through targeted strategies, policymakers can drive meaningful progress towards a more sustainable and effective military force. In conclusion, understanding public perception and acceptance of fuel-efficient military vehicles is essential for driving innovation and progress in military technology. Through the lens of the Innovation Acknowledgment Show and Advancement Hypothesis, we can gain valuable insights into the factors influencing public attitudes towards these vehicles. By leveraging these insights, policymakers and decision-makers can develop effective strategies to promote the adoption and implementation of fuel-efficient military vehicles, thereby enhancing military capabilities and sustainability.

The insights derived from the Innovation Acknowledgment Show and Advancement Hypothesis offer a comprehensive understanding of public perception towards fuel-efficient military vehicles (Jones, 2018). By recognizing the multifaceted nature of acceptance and the importance of technological progress, policymakers can develop targeted interventions to address barriers and capitalize on opportunities for innovation in military vehicle development. "Effective strategies for promoting the adoption and implementation of fuel-efficient military vehicles require a multifaceted approach," (Smith, 2020). This may involve targeted investments in research and development, public outreach initiatives, and stakeholder engagement efforts aimed at fostering awareness, understanding, and support for fuel-efficient technologies. Furthermore, "enhancing military capabilities and sustainability through the adoption of fuel-efficient vehicles is not only strategically advantageous but also environmentally responsible," (Brown, 2019). By reducing reliance on traditional fuel sources and minimizing environmental impact, fuel-efficient military vehicles contribute to the broader goals of national security and environmental stewardship. In conclusion, the integration of fuel-efficient technologies into military operations represents a critical step towards achieving sustainable and effective defense capabilities. By aligning policy initiatives with public perception and leveraging insights from theoretical frameworks like the Innovation Acknowledgment Show and Advancement Hypothesis, policymakers and decision-makers can drive meaningful progress towards a more sustainable and technologically advanced military force.

V. INTERPRETATION RESULTS

The main findings of this study reveal that the use of hybrid electric military vehicle technology has a significant positive impact on performance, environmental and reliability aspects This finding is what have been found in several previous studies showing similar benefits of this technology are consistent (Smith & Johnson, 2020;Brown and Wilson, 2019). In particular findings show that hybrid electric vehicles can be used to improve military performance by reducing emissions by reducing energy dependence on conventional fuels This supports previous theories emphasizing the importance of resource efficiency in effective protection strategies (Wang & Patel, 2016). Furthermore, the findings also show that hybrid electric vehicles have high reliability and availability, important factors for successful military operations (Nguyen et al., 2014).

A. Early Interests and Interests

Most respondents expressed a strong interest in the concept of hybrid electric vehicles. This makes sense in terms of the widely researched technology adoption hypothesis found in the literature. Technology adoption theory states that a person's desire to adopt technology is influenced by a number of factors, including opinions about how practical and simple technology is to use (Davis, 1999). Venkatesh) and others, 1989). In this survey, respondents may feel that hybrid electric vehicle technology offers significant benefits, such as fuel efficiency and reduced emissions, as well as ease of use functioning in conjunction with the existing transport system. Therefore, this concept is often very popular. In addition, customer engagement theory can also provide insight into this phenomenon. According to this theory, an individual's level of involvement with a product or idea may affect perceptions of the product's value and utility (Zaichkowsky, 1985). In the survey of hybrid electric vehicles, respondents who are more involved in environmental and technological issues seem more interested in the idea, because they hear it its value and utility under a wider context.

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B. *Perception of Benefit*

The high level of confidence in the benefits of electrohybrid technology in this study can be examined using the technology acceptance theory and the first value discovery theory, the technology acceptance theory, by Davis (1989). proposed and further developed by Venkatesh et al. (2003), explain that the acceptance or adoption of technology is influenced by one's perception of the usefulness and ease of use of technology In this study, the greater trust of the respondents in on the benefits of hybrid technology shows that they believe it will change the quality of daily life and the future of transportation. This is consistent with the functional aspect of technology acceptance dimensions, where respondents find these technologies useful and appropriate in their context.

Additionally, value insight theory, as proposed by Zaczkowski (1985) can also provide insight into this phenomenon. This theory states that an individual's perceived value of a product or idea will affect his or her interest in and involvement with it. Respondents in this study consider hybrid power technologies to have high intrinsic advantages, such as environmental benefits, energy efficiency, and potential cost savings money has been around for a long time so they tend to express a lot of confidence in the benefits of this technology, due to the good standards associated with it.

Understanding this phenomenon through technology acceptance theory and value discovery theory frameworks, it can be concluded that high confidence in the benefits of electrohybrid technologies is reflected in the respondents' positive attitudes towards the benefits and the advantages of this technology. This provides a solid foundation for wider adoption in society, and demonstrates the importance of the values associated with this technology in everyday life and in future travel.

C. *Military Needs and Technological Innovation*

The study results show that the larger part of respondents feel that the require for fuel-efficient military vehicles is exceptionally extraordinary, as well as the significance of innovative advancement in military vehicles, can be analyzed from the viewpoint of innovation acknowledgment show and advancement hypothesis. First, technology acceptance theory, proposed by Davis (1989) and further developed by Venkatesh et al. (2003), clarifies that acknowledgment or appropriation of an innovation is impacted by the individual's recognition of the convenience and ease of utilize of the innovation. Within the setting of this overview, respondents' high awareness of the require for fuel-efficient military vehicles can be seen as a result of their discernment of the value of electric cross breed innovation in a military context. They may see this innovation as an viable arrangement to overcome the calculated and financial challenges related with the utilize of ordinary fills in military operations. In expansion, the significance of innovative advancement in military vehicles can too be seen as portion of their discernment of the value of imaginative innovation in moving forward by and large military operational execution and effectiveness.

To comprehend the winning opinion regarding the necessity for fuel-efficient military vehicles and the emphasis on innovative development, a few hypothetical systems give profitable experiences. Among these, the Theory of Planned Behavior (TPB) stands out, declaring that individuals' behavior is affected by their states of mind, subjective standards, and seen behavioral control. Ajzen (1991) explained this hypothesis, highlighting how attitudes towards a behavior, subjective standards, and seen behavioral control collectively shape individuals' eagerly and subsequent actions. Within the setting of military operations, increased mindfulness of the natural emergency and the reliance on fossil fuels likely impacts states of mind towards fuel-efficient military vehicles. Moreover, societal standards emphasizing natural supportability and the seen control over adopting energy-efficient innovations contribute to the acknowledgment of the significance of fuel effectiveness in military vehicles.

Moreover, the Advancement Diffusion Theory, pioneered by Rogers (2003), offers a focal point through which the selection of advancements, such as fuel-efficient military vehicles, can be caught on. Agreeing to this hypothesis, the appropriation process advances through stages including information, influence, choice, usage, and affirmation. Within the military context, the affirmation of the necessity for fuel-efficient vehicles and the acknowledgment of innovative innovations likely represent the initial stages of this adoption process. Subsequent steps would include efforts to convince and impact other partners, eventually driving to choices with respect to the selection of energy-efficient advances in military operations.

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Furthermore, the Resource Dependence Theory, articulated by Pfeffer and Salancik (1978), sheds light on organizations' dependence on external assets to fulfill their needs. Within the military space, where operational viability is fundamental, the require for resources such as fuel and innovative innovations gets to be critical. Increased awareness of this asset dependence likely drives speculations within the advancement of energy-efficient technologies to mitigate dependence on rare and costly assets, in this way upgrading military capabilities and effectiveness.

The acknowledgment of the need for fuel-efficient military vehicles and the significance of technological innovation in military settings stem from a conversion of components outlined by hypothetical systems such as the Theory of Planned Behavior, Innovation Diffusion Theory, and Resource Reliance Theory. By understanding these basic drivers, vital initiatives can be defined to advance the appropriation of energy-efficient technologies, in this manner supporting military capabilities and maintainability within the confrontation of advancing challenges. Second, innovation theory, which was first introduced by Rogers (1962), explains that advancement appropriation is impacted by a number of components, including the characteristics of the development itself and the characteristics of the person or organization that embraces it. Within the setting of this study, the high awareness of the significance of advancement in military vehicles can be caught on as a result of respondents' appreciation of the esteem of development in progressing military execution and flexibility. They may see mechanical advancement as an implies of upgrading military capabilities to confront progressively complex and assorted challenges. By understanding this phenomenon through the system of innovation acknowledgment hypothesis and advancement hypothesis, it can be concluded that respondents' awareness of the require for fuel-efficient military vehicles and the significance of development in military vehicles is reflected in their recognitions of the value and esteem of imaginative innovation in moving forward military operational proficiency and execution. This gives a solid establishment for the improvement and appropriation of more progressed and productive advances within the setting of military defense.

In the setting of military vehicle development, Social Learning Hypothesis highlights the significance of social intelligent and observational learning in forming individuals' attitudes and behaviors towards advancement adoption. Military personnel frequently depend on their peers, pioneers, and specialists within the organization to secure information and abilities related to modern technologies and innovations in military vehicles.. By observing the encounters and results of others who have received innovative advances, people can evaluate the benefits and dangers related with development appropriation. Positive results and victory stories shared inside the military community can serve as effective inspirations for development appropriation, whereas negative encounters may lead to caution or resistance.

Moreover, Social Learning Theory highlights the importance of interpersonal communication and collaboration in enabling the sharing of information and ideas about adopting innovation. Cooperative work within military units and between different organizations enables the exchange of successful strategies, valuable lessons, and creative solutions for typical obstacles in the development of military vehicles. Incorporating Social Learning Theory enhances our comprehension of how social factors impact the adoption of innovation in military settings. By acknowledging the significance of social learning processes, military organizations can use peer networks, mentorship programs, and collaborative platforms to encourage innovation and speed up the uptake of advanced technologies in military vehicle development. Social Learning Theory adds to other theories like Rogers' Diffusion of Innovations Theory, Davis' Technology Acceptance Model, Pfeffer and Salancik's Resource Dependence Theory, and DiMaggio and Powell's Institutional Theory, creating a thorough framework for grasping the intricacies of innovation adoption in military vehicle development

D. Optimizing the Defense Budget Through Investment in Electric Hybrid Tecchnology

The larger part of respondents expressed their desire for improved performance of military vehicles utilizing electric hybrid innovation, as well as back for the integration of this innovation in military foundation. The conviction that the integration of electric cross breed innovation can increment the proficient utilize of assets within the defense budget indicates support for speculation within the improvement of this innovation. From a theoretical standpoint, this situation can be viewed through the framework of the theory of technological innovation diffusion. This theory suggests that new technologies are first adopted by a small group of early users before becoming popular among the general population. The majority of respondents expressing a

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desire for electric hybrid innovation indicates that these technologies are gaining acceptance and popularity within the military community, approaching a tipping point.

Furthermore, technological determinism suggests that technological progress is the primary force behind social and economic transformation (Bijker, Hughes, & Pinch, 2012). The drive for enhanced performance and resource efficiency in military vehicles mirrors a larger societal trend towards sustainability and innovation-oriented solutions. By adopting electric hybrid technology, the military improves its operational capabilities and supports environmental responsibility and resource conservation on a larger scale. In essence, the demand for electric hybrid advancements in military vehicles and infrastructure, along with the acknowledgment of its ability to improve resource efficiency in defense budgets, shows a coming together of strategic, economic, and societal influences pushing for the use of sustainable technologies in the defense industry. This trend highlights how crucial it is to innovate and adapt to sustain military readiness and relevance in a world that is becoming more complex and resource-limited.

There's solid agreement that investment within the advancement of hybrid-electric military vehicles can optimize defense budgets. This statement is strengthened by the most noteworthy normal score for the articulation expressing that venture within the advancement of electric hybrid military vehicles is an viable step to optimize the defense budget, this appears that the larger part of respondents emphatically concur with this thought. With a restricted defense budget, optimizing assets is the key to keeping up a country's defense quality. The integration of electric hybrid technology in military vehicles offers the potential to extend operational effectiveness, decrease reliance on costly fossil fuels, and expand operational range, all of which can result in long-term budget investment funds. The larger part of respondents' support for investment in this innovation reflects an understanding of the significance of adjusting to innovative changes to preserve defense availability.

In this context, Rogers' (1962) Innovation Hypothesis is important since it describes the method of diffusion of innovation, including within the military sector. This hypothesis shows that the appropriation of innovations such as electric hybrid technology will encounter certain stages, beginning from initiation by early interested bunches (trend-setters) to acknowledgment by the larger part (early majority and late majority). The larger part of respondents showing support for the integration of electric hybrid technology can be interpreted as portion of these stages of diffusion. Moreover, the hypothesis highlights the significance of components such as relative advantage, appropriateness, and complexity in affecting innovation adoption, which is steady with respondents' convictions within the effectiveness benefits of electric hybrid technologies in military framework.

Another important hypothesis is Kotter's Change Management Hypothesis (1996). This hypothesis shows the key steps in overseeing change in organizations, including within the military environment. Respondents who support the integration of electric hybrid technology in military platform reflect the solid consolidation arrangement stage, one of the steps in this hypothesis. In addition, the conviction within the effective benefits of electric hybrid technology within the utilize of defense budget assets can moreover be translated as portion of the step of communicating a vision of change, which is an vital aspect in this theory. Thus, the combination of Rogers' (1962) Development Hypothesis and Kotter's (1996) Change Management Hypothesis makes a difference clarify respondents' motivations and support for the integration of electric hybrid technology in military foundation, as well as their coviction within the effectiveness benefits that this innovation can bring.

E. Environmental Impact and Operational Effectiveness

In replying questions 9 to 11, survey participants evaluated the fundamental effects of implementing electric hybrid technology in a military setting. Rogers (1962) proposed the Diffusion of Innovations theory which offers insights into how certain groups may accept advancements, such as electric hybrid technology. The hypothesis explains how respondents view electric hybrid technology as a superior and viable solution in comparison to traditional methods relying on fossil fuels. This could strengthen their belief in decreasing dependence on fossil fuels and the alternative protection methods promoted by electric hybrid technology.

Furthermore, social network theory provides understanding on the dissemination of information regarding electric hybrid technology among military personnel and decision-makers, as noted by Scott in 2000. By grasping the communication and

influence dynamics in military groups, it is possible to pinpoint influential leaders who can help introduce new technologies. Moreover, the concept of technological determinism implies that the military's decision to utilize electric hybrid technology is influenced not just by practical reasons, but also by wider socio-cultural influences (Winner, 1986). With a changing focus on sustainability and environmental accountability, military organizations are under more pressure to adopt cleaner and more efficient technologies.

Additionally, the technology acceptance model (TAM) concept offers a structure to comprehend the factors affecting individuals' adoption and utilization of new technologies (Davis, 1989). Through investigating the perceived utility and ease of use, TAM helps explain why individuals may perceive electric hybrid technology positively and be more willing to support its incorporation into military activities. Finally, ideas from environmental psychology can help us understand how people's views and actions are impacted by their environment and how they believe their choices affect the world (Steg & Vlek, 2009). Gaining insight into the psychological processes influencing individuals' opinions on electric hybrid technology can help develop tactics to encourage its use and address opposition in military settings.

For instance, Rogers (1962) explained, "Relative advantage is the degree to which an innovation is considered better than existing thoughts or practices. This affects an individual's choice to acknowledge or dismiss the innovation." At that point, in replying questions 12 to 16, respondents evaluated the operational viability and encourage vital benefits of utilizing electric hybrid technology in military vehicles. Theory "Technology Acceptance Model (TAM) " Show by Davis (1989) and Venkatesh et al. (2003) can give understanding into respondents' perceptions and acceptance of this technology. According to TAM, components such as recognitions of the value and ease of utilize of technology impact an individual's intention to embrace that technology. In this context, respondents who communicated certainty within the benefits of electric hybrid technology may have been driven by their perception of the value and operational adequacy of the innovation in improving troop performance and survivability on the battlefield. For instance, within the words of Davis (1989), "Recognitions of usefulness reflect a person's degree of conviction that employing a specific framework will improve his or her execution." From these results, it can be concluded that the larger part of respondents see electric hybrid technology as a promising arrangement to overcome environmental and operational challenges in a military setting, based on convictions built by the Diffusion of Innovations hypothesis and the Technology Acceptance Model.

F. Infrastructure and Readliness Adjustments

The key question emphasized respondents' understanding of the difficulties that will come with incorporating hybrid-electric technology in the military, like modifying military equipment and training. Even though there is knowledge of the necessary adjustments in platform and training, backing for this integration remains apparent. Awareness of these difficulties shows that respondents grasp the intricacies involved in implementing electric hybrid technology in a military setting. In the face of infrastructure changes, additional investments might be necessary to adapt and synchronize the charging platform, battery charging infrastructure, and power distribution systems needed to facilitate electric military vehicles. Additionally, specialized training is needed for troops to be knowledgeable about modern technology, operational techniques, and maintenance for electric hybrid vehicles.

Additionally, the TOE framework can offer understanding on the elements impacting the implementation of electric hybrid technology in a military setting (Tornatzky & Fleischer, 1990). This structure takes into account technological, organizational, and environmental factors that could either help or impede the incorporation of new technologies into current systems.

In addition, the organizational learning theory emphasizes the significance of adaptive capacity and knowledge acquisition in military organizations (Argyris & Schön, 1978). Organizational learning processes will be essential in aiding the military in adapting to the challenges of incorporating electric hybrid technology, enabling the acquisition of new skills and capabilities. Further, knowledge obtained from studies in human factors and ergonomics can guide the development of training programs and interfaces for electric hybrid military vehicles (Salvendy, 2012). Recognizing human abilities and restrictions is crucial to guaranteeing that soldiers can efficiently use and upkeep these advanced technologies in challenging and critical settings.

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Moreover, the Resource-Based View (RBV) provides a theoretical perspective on how investments in infrastructure and training can enhance a military organization's strategic capabilities (Barney, 1991). By using special resources and skills in electric hybrid technology, military groups can improve their competitive edge and effectiveness. Finally, innovation diffusion theory can provide understanding on how information about electric hybrid technology spreads in the military community and impacts decision-making (Rogers, 2003). Comprehending how knowledge spreads is essential for encouraging the extensive uptake and successful execution of electric hybrid innovation in military settings.

Theory Change Management, as created by Kotter (1996), can give understanding into how organizations look toward and manage change. Agreeing to this hypothesis, steps such as shaping a solid consolidation, communicating a vision of change, and giving satisfactory training are key components in encouraging the selection and integration of modern technologies. In a military context, the integration of electric hybrid technologies will require cautious planning and management of change to guarantee arrangement between vital goals, existing infrastructure, and troops needs. For instance, Kotter (1996) states, "Key steps in overseeing change include shaping a solid consolidation, communicating the change vision, and giving satisfactory training for staff." Also, Military Technology Hypothesis, as proposed by Chalk (1993), highlights the significance of innovative adjustment and advancement within the military context. Concurring to this hypothesis, military innovation not as it were capacities as a implies of combat, but moreover reflects the structure, strategy and political dynamics of military control. Within the setting of the integration of electric hybrid technologies, changes in infrastructure and personnel training can be interpreted as part of a broader advancement of a country's defense capabilities within the confront of modern challenges.

Chalk (1993) explained, "Military technology isn't as it were an implies of combat, but moreover reflects the structure and political elements of military control and its defense technique." Hence, in spite of the fact that respondents recognize the challenges related with integrating electric hybrid technology within the military, their support for execution remains solid. Awareness of fundamental changes in foundation and preparing highlights the significance of successful change administration within the confront of military technological advancement.

VI. CONLCUSION

In this research, we have explored the integration of hybrid-electric military vehicle innovation within the context of defense, military budget efficiency and operational maintainability. The main discoveries of this research reflect the critical positive affect of utilizing this innovation in different military operational, environmental and reliability perspectives. We found that electric hybrid vehicles are able to extend operational effectiveness by decreasing reliance on ordinary fuels, decreasing exhaust emissions, and increasing the operational reliability of military units.

In spite of the fact that the results of this research give important knowledges, there are a few methodological limitations that need to be noted. One of the most limitations is the limited information accessible, particularly in terms of field information describing the use of this innovation in genuine operational circumstances. In expansion, this study is additionally limited to a certain time span and does not consider relevant components that will change over time.

The viable implications of the results of this study are exceptionally critical in the context of defense policy advancement and military budget management. The utilize of hybrid electric military vehicle technology can make a positive contribution to operational proficiency and environmental supportability, whereas also expanding the adaptability and versatility of military units. Subsequently, practical implications include recommendations to extend investment in the improvement and utilize of these innovations, as well as to incorporate natural considerations in defense planning and decision-making.

In conclusion, this research has given important understanding into the affect of integrating hybrid electric military vehicle innovation. Whereas there's still room for further research, these discoveries give a solid foundation for the advancement of feasible defense arrangements and viable military operational methodologies in the future. By continuing to investigate the potential and challenges of this innovation, ready to construct a more productive, maintainable and reliable defense future.

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