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The **IAARHIES** (The International Academic Association of Researchers in Humanities, IT, Engineering & Science) is an international non-profit forum and association of researchers in the field of Humanities, Information Technology, Engineering and Science. IAARHIES is the brand name of The Society for Academic Research (SAR), registered under the section 20 of Societies **Registration Act 1860**.

IAARHIES, under the aegis of The Society for Academic Research (Regd.) established in Jaipur, India is an international, independent, private, non-profit and chartered association founded in 2015 to support and encourage research work in the various subjects under Humanities, Information Technology, Engineering and Science. IAARHIES was established as an association of researchers, scholars, students and professors from different discipline with a mission to organize international conferences and workshops. Our conferences are aiming at bringing researchers from various fields to share their current research, ideas and experiences.

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EDITORIAL

Greetings from IAARHIES and the Conference organizing Committee!

At the very outset, we extend a warm welcome to all our distinguished guests, speakers and the participants who have joined us for this International Conference in Saint Petersburg, Russia.

We are happy to receive the research papers from all part of the world and some of the best papers published in this proceedings. The current edition of the proceedings brings out the various research papers from diverse area of Business, Economics, Management, Engineering, Technology, Science and Humanities. The IAARHIES conferences are an attempt to provide a platform to the researchers, educators and professionals to present their innovative thoughts and discoveries and to explore future trends and applications in the field of Engineering and Technology. However, this conference will also provide a forum for dissemination of knowledge on both theoretical and applied research on the above said area with an ultimate aim to bridge the gap between these coherent disciplines of knowledge. Our final goal is to make the Conference proceedings useful and guiding factor to audiences involved in research in these areas, as well as to those involved in design, implementation and operation, to achieve their respective goals.

We once again are thankful to all the delegates participating in this event in Saint Petersburg, Russia. We are sure about the contributions to be added by the participating authors to the research community and rapidly growing field of education throughout the globe. We are also thankful to all the International advisory members and reviewers for making this event a successful one.

We are specially thankful to **Mr. Edgar Gvazava**, the **youngest researcher** ever registered with IAARHIES International Conferences. We wish him all the success in life ahead.

*“Let your mind start a journey through a strange new world,
Leave all thoughts of the world you knew before,
Let your soul take you where you long to be,
Close your eyes, let your spirit start to soar and you'll live as you've never lived before.”*

-Erich Fromm

Sandeep Kumar

Dr. Hardev Sharma

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INTEGRATED STRATEGIC MANAGEMENT TAXONOMY OF TECHNOLOGY AND INNOVATION

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ABSTRACT - Cutting edge technology management goes beyond basic research and development (R&D). Increasingly, corporate strategists are making a more precise distinction between “technology” and “technology management.” The main purpose of this study was to develop an empirically derived classification system (taxonomy) for sustaining industry leadership, through the relationships that exist between technology and innovation strategy, technology management and company performance.

Keywords Company Performance; Innovation; Strategy; Technology Management.

1. INTRODUCTION

For technology intensive companies, the pace of advancements in technology further intensifies the dynamics of the competition. Cutting edge technology management goes beyond basic research and development (R&D). Increasingly, corporate strategists are making a more precise distinction between “technology” and “technology management.” International business literature suggests that companies develop competitive advantages in order to ensure success in current markets (Hamel & Prahalad, 2006; Levitt, 1983; Ohmae, 1989; Panagiotou, 2007; Pérez-Luño & Cambra, 2013). Such advantages tend to be monopolistic assets, either tangible or intangible (Clemens, 2006), such as new technology, patented products, product development capability and marketing skills.

The main purpose of this study was to develop an empirically derived classification system (taxonomy) for sustaining industry leadership, through the relationships that exist between technology and innovation strategy, technology management and company performance. The study thus focuses on the following three central research questions:

1. What are the prevalent technology and innovation content dimensions being employed by South African companies in technology intensive industries?
2. What technology management process dimensions are being used to develop and implement the prevalent technology and innovation strategies?
3. What relationships can be observed between the technology and innovation content dimensions,

technology management process dimensions and company performance?

The dimensions pertaining to this study were derived from those most often cited in the literature and are a consolidation of the following studies: Maidique & Patch (1988), Miller (1988), Clark et al., (1989), Dvir et al., (1993), Zahra & Covin (1993), Pelser (2014a), Pelser (2014b), Pelser (2014c), Pelser (2014d), Pelser (2014e).

A non-probability, judgment sample of companies listed on the Johannesburg Stock Exchange (JSE) was taken. Two hundred companies or divisions were identified and incorporated in the survey after the screening stage. Feedback was received from 89 R&D managers of these two hundred companies, stating their willingness to participate in the survey. A total of 84 completed responses were received and captured for the study.

ANALYSIS OF RESULTS

Company Performance Dimensions

Six company performance variables (B31 – B36) were factor-analysed by using the principal axis factoring method. Then, using the latent root criterion, two factors were extracted on the basis of their Eigenvalues being greater than 1. Together they accounted for 75.80% of the variation in the data. The final statistics showed, that 75.80% of the variance was explained by the two factors. The reproduced correlation matrix contained 3 residual values (20%) greater than .05, indicating that the model fits the data. All of the primary factor loadings used in the factor interpretation, exceeded .50 in value.

1. *Input Performance* – The conceptual definition for this factor is the extent to which the R&D manager or other top manager perceives the innovation management organisation has achieved its desired objectives over the last three years. Taken together, this pattern of factor loadings clearly reflects the effectiveness of the innovation management organisation (IMO)..

2. *Output Performance* – This factor represents the performance of the company where (1) patent information was used to measure R&D activities and (2) return on assets (ROA) was used to measure company financial performance. The patent's registered variable (B35) and the return on assets variable (B36) loaded heavily on this factor, indicating the degree of fit for this performance measure.

Technology Management Dimensions

Twelve technology management variables (A11, A12 and A21 – A30), were factor-analysed by using the principal axis factoring method. Together they accounted for 78.81% of the variation in the data. The Chi-square statistic was 922.647 with 66 degrees of freedom, which is significant at the .000 level. The reproduced correlation matrix contained 12 residual values (18%) greater than .05, indicating that the model fits the data.

All of the primary factor loadings used in the factor interpretation exceeded .50 in value.

1. *R&D Commitment* – The Eigenvalue of the first factor was 5.729. The technology awareness variables (A21-A22), technology acquisition variables (A23-A24) and the technology and product planning variables (A25-A26) loaded heavily on this factor. Taken together, these patterns of factor loadings clearly reflect the aggressiveness of a company's R&D commitment.
2. *Control Market Planning* – The Eigenvalue of the second factor was 2.889. The R&D organisation and management variables (A27-A28) and R&D investment variables (A29-A30) loaded heavily on this factor, indicating the degree of researcher empowerment, researcher rewards and integration of R&D with the business units.
3. *Process Management* – The Eigenvalue of the third factor was 1.806. The manufacturing and process technology variables (A11-A12) both loaded heavily on this factor. This indicates that the underlying factor

relates to the company's manufacturing and technology processes.

Innovation Strategy Dimensions

Eight innovation strategy variables (A13 – A20) were factor-analysed by using the principal axis factoring method. Together they accounted for 82.61 percent of the variation in the data.

1. *New Product Innovation* – The Eigenvalue of the first factor was 5.702. The product innovation variables (A13-A14), marketing innovation variables (A17-A18) and the management innovation variables (A19-A20), loaded heavily on this factor. Taken together, this pattern of factor loadings clearly reflects the aggressiveness of a company's new product development program in relation to the product, marketing and innovation activities.
2. *Process Innovation* – The Eigenvalue of the second factor was 1.744. The two process innovation variables (A15-A16) both loaded heavily on this factor. The process innovation variables were selected to measure the emphasis a company places on a stated and working strategy of process innovation and the way it evaluates process innovation's performance relative to objectives.

Technology Strategy Dimensions

The correlation matrix for the ten strategy variables was reviewed to confirm the existence of a substantial number of correlations, which indicates the existence of common factors. All the variables had correlations greater than .22 and almost 60 percent of the matrix elements were greater than .50. Bartlett's test of sphericity confirmed, that the correlation matrix was not an identity matrix. The Kaiser-Meyer-Olsen (KMO) measure as sampling adequacy was .778.

1. *Technology Focus* – The Eigenvalue of the first factor was 5.643. The technology posture variables (A1-A2), technology level variables (A3-A4), technology breadth variables (A5-A6) and the technology timing variables (A9-A8) loaded heavily on this factor. Taken together, this pattern of factor loadings clearly reflects the aggressiveness of a company's technology policy.
2. *Product Development Intensity* – The Eigenvalue of the second factor was 1.708. The two product development variables (A7-A8) both loaded heavily

on this factor. The product development intensity variables were selected to measure the extent to which a company competes on the basis of frequent new product introductions and frequent product upgrades.

Reliability and Validity

The content validity of the questions was obtained from the pilot study and the cognitive confirmation from the five technology experts. The consistency of the survey data was assessed by using Cronbach's coefficient alpha, which measure the consistency of the entire scale. For the R&D commitment it is .9367; for the control market planning it is .8601; for the process management it is .8826, and for the input performance it is .8887. These large values indicate a high degree of data stability.

Multiple Regression Analysis

The objective of multiple regression analysis was to use the independent variables (seven factors) whose values are known to predict the single dependent values (two performance factors). By using p-values, it was possible to distinguish between the levels of significance. It is apparent from Table 1 that both the R&D Commitment and Control Market Planning factors have a significant positive effect on Input and Output Performance.

Table 1: Correlation Matrix – R&D, CMP, PM

		R&D Commitment	Control Market Planning	Process Management	Input Performance	Output Performance
R&D Commitment	Pearson Correlation	1.000	.638*	.012	.579*	.710*
	Sig. (2-tailed)	.	.000	.917	.000	.000
	N	84	84	84	84	84
Control Market Planning	Pearson Correlation	.638*	1.000	-.039	.731*	.382*
	Sig. (2-tailed)	.000	.	.721	.000	.000
	N	84	84	84	84	84
Process Management	Pearson Correlation	.012	-.039	1.000	-.195	-.030
	Sig. (2-tailed)	.917	.721	.	.075	.788
	N	84	84	84	84	84
Input Performance	Pearson Correlation	.579*	.731*	-.195	1.000	.435*
	Sig. (2-tailed)	.000	.000	.075	.	.000
	N	84	84	84	84	84
Output Performance	Pearson Correlation	.710*	.382*	-.030	.435*	1.000
	Sig. (2-tailed)	.000	.000	.788	.000	.
	N	84	84	84	84	84

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

It is apparent from Table 2 that the New Product Innovation factor has a significant positive effect on Input Performance (p < 0.01).

Table 2: Correlation Matrix – NPI, PI

		R&D Commitment	Control Market Planning	Process Management	Input Performance	Output Performance
R&D Commitment	Pearson Correlation	1.000	.638*	.012	.579*	.710*
	Sig. (2- tailed)	.	.000	.917	.000	.000
	N	84	84	84	84	84
Control Market Planning	Pearson Correlation	.638*	1.000	-.039	.731*	.382*
	Sig. (2- tailed)	.000	.	.721	.000	.000
	N	84	84	84	84	84
Process Management	Pearson Correlation	.012	-.039	1.000	-.195	-.030
	Sig. (2- tailed)	.917	.721	.	.075	.788
	N	84	84	84	84	84
Input Performance	Pearson Correlation	.579*	.731*	-.195	1.000	.435*
	Sig. (2- tailed)	.000	.000	.075	.	.000
	N	84	84	84	84	84
Output Performance	Pearson Correlation	.710*	.382*	-.030	.435*	1.000
	Sig. (2- tailed)	.000	.000	.788	.000	.
	N	84	84	84	84	84

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

It is also apparent from Table 3 that both the Technology Focus and Product Development Intensity factors have a significant positive effect on Input and Output Performance.

Table 3: Correlation Matrix – TF, PDI, PM

		Technology Focus	Product Development Intensity	Process Management	Input Performance	Output Performance
Technology Focus	Pearson Correlation	1.000	.568*	.039	.698*	.634*
	Sig. (2-tailed)	.	.000	.727	.000	.000
	N	84	84	84	84	84
Product Development Intensity	Pearson Correlation	.568*	1.000	-.020	.510*	.577*
	Sig. (2-tailed)	.000	.	.853	.000	.000
	N	84	84	84	84	84
Process Management	Pearson Correlation	.039	-.020	1.000	-.195	-.030
	Sig. (2-tailed)	.727	.853	.	.075	.788
	N	84	84	84	84	84
Input Performance	Pearson Correlation	.698*	.510*	-.195	1.000	.435*
	Sig. (2-tailed)	.000	.000	.075	.	.000
	N	84	84	84	84	84
Output Performance	Pearson Correlation	.634*	.577*	-.030	.435*	1.000
	Sig. (2-tailed)	.000	.000	.788	.000	.
	N	84	84	84	84	84

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

It is also apparent from Table 3 that both the Technology Focus and Product Development Intensity factors have a significant positive effect on Input and Output Performance.

The level of relationship (R^2 or Rsq) that can be detected reliably with the proposed regression analysis was calculated to indicate the percentage of total variation of the Input Performance factor (InP). The Technology Focus factor ($Rsq = 0.4869$) explains 49% of the total variation of the Input Performance factor. It indicates that the intensity of a company's technology policy, including the propensity to proactively use technology as a competitive weapon and a key-positioning factor, determines the variation of the company's contribution to sales, efficiency of innovation project management, impact of the innovations and R&D expenditure. The Product Development Intensity factor ($Rsq = 0.2606$) explains 26% of the total variation of the Input Performance factor. It indicates, that the extent to which a company competes on the basis of frequent new product introductions and frequent product upgrades, determine the variation of the company's contribution to sales, efficiency of innovation project management, impact of the innovations and R&D expenditure.

In summary then, the constant term (-1.640) and the coefficients (0.525, 0.244 and -0.392) for Control Market Planning (CMP), Technology Focus (TF) and Process Management (PM) can be identified respectively to be the best predictor of the Input Performance factor (InP). It is apparent that both the Control Market Planning and Technology Focus factors have a positive effect on Input Performance, whereas the Process Management factor has a negative effect. The predictive equation for the Input Performance factor is:

$$\text{InP} = -1.640 + 0.525\text{CMP} + 0.244\text{TF} - 0.392\text{PM}$$

The level of relationship (R^2 or Rsq) that can be detected reliably with the proposed regression analysis was calculated for the creation of the Output Performance factor (OutP). The Technology Focus factor ($Rsq = 0.4025$) explains 40% of the total variation of the Output Performance factor. It indicates, that the intensity of a company's technology policy, including the propensity to proactively use technology as a competitive weapon and a key-positioning factor, determines the variation of the company's contribution to R&D activities (patents registered) and the company's efficiency in using its assets (return on assets). The Product Development Intensity factor ($Rsq = 0.3329$) explains 33% of the total variation of the Output Performance factor. It indicates, that the extent to which a company competes on the basis of frequent new product introductions and frequent product upgrades determines the variation of the company's contribution to

R&D activities (patents registered), and the company's efficiency in using its assets (return on assets).

In summary then, the constant term (-11.629) and the coefficients (1.531, 1.502 and -0.472) for R&D Commitment (R&D), Product Development Intensity (PDI) and New Product Innovation (NPI) can be identified respectively to be the best predictor of the Output Performance factor (OutP). It is apparent that both the R&D Commitment and Product Development Intensity factors have a positive effect on Output Performance, whereas the New Product Innovation factor has a negative effect. The predictive equation for the Input Performance factor is:

$$\text{OutP} = -11.629 + 1.531\text{R\&D} + 1.502\text{PDI} - 0.472\text{NPI}$$

MANAGERIAL IMPLICATIONS

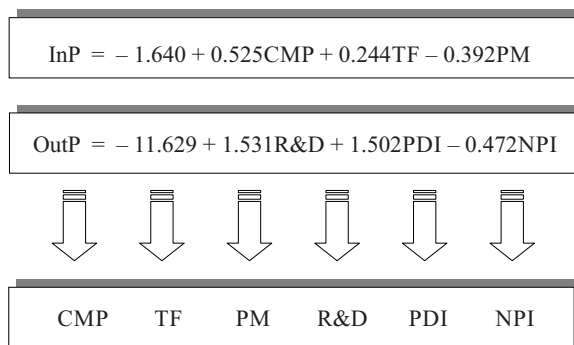
The principal objective of this study, was to develop an empirically derived classification system (taxonomy) for sustaining industry leadership, through the relationships that exist between technology and innovation strategy, technology management and company performance. The first step necessary for this task, was to compile content and process dimensions of technology and innovation strategy and technology management. By isolating these dimensions into seven technology factors, it was possible to identify the technology strategy and management archetypes being used by the sample of technology intensive companies.

The same procedure was followed for obtaining two factors as measures for company performance. The next step was to find the relationships that exist between the seven archetypes and the two performance factors. After successfully completing the multiple regression analysis, two distinctive models were created. By looking at the building blocks for the strategic management taxonomy (Figure 1), it is indicated that the Process Management factor and the New Product Innovation factor have negative regression coefficients of -0.392 and -0.472 respectively. This is made clear by the fact that the Process Management factor explains only 0.1% of the total variation of the Output Performance factor and 4% of the total variation of the Input Performance factor.

Similarly, the Process Innovation factor explains only 3% of the total variation of the Output Performance factor. This means, that these two archetypes have a negative effect on the study's two performance dimensions in terms of the output. The Process Management factor refers to the

improvements in quality, inventory control, customer lead-times, machine use and efficiency, staff efficiency and customer image. Companies that make use of technology to achieve low manufacturing costs and to improve production flexibility or reduce lead-times, do little to expand opportunity horizons or renew the organisational competencies. This leads to the reduction in company resources, which creates anxiety that stifles innovation and eliminates R&D initiatives.

Figure 1: Building Blocks for the Strategic Management TaxCONCLUSION



The present study makes a contribution to the field of strategic management research by integrating the dimensions of several previous studies, to derive a more comprehensive taxonomy of technology and innovation strategy and management archetypes. It also derives a broader set of dimensions for use in strategic management research. The results show, that technology and innovation strategy and technology management choices can significantly affect company performance. It thereby indicates which of the underlying dimensions have the strongest relationship with company performance. The study also provides evidence that the strategy content – process interaction may be a significant factor in company performance.

From an industry perspective, the greatest significance of these findings may be, that they accentuate the importance of technology policy in strategic management. The substantial differences in performance associated with the dimensions do not necessarily indicate that a given company should choose a particular technology strategy, innovation strategy or management approach, but rather indicates that technology policy decisions may have a substantial leverage on a company's performance and should be analysed and exercised with care and deliberation.

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THE MAIN MACHINE LEARNING ALGORITHMS THAT ARE USED WITH PERSONAL DATA MINING AND THE CHALLENGES OF MINING PERSONAL DATA THAT HAS BEEN OBTAINED FROM SMARTPHONES/WEARABLE DEVICES

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ABSTRACT - The widespread of using information technology and the ease of making them available are leading to inflate amount of data massively, but in random form. Thus, there is a need to develop tools and concepts that have an ability to analysis, and extract knowledge, because conventional ways (statistical approach) do not have ability to deal with that massive amount of data. The machine learning will be focused in this paper in order to understand the main algorithms that are using to mining personal data that are obtained from different sources such as wearable devices and smart phone. In addition, the main challenges that are being faced several of studies through mining personal data.

Keywords - Wearable; Personal Data Mining; Data Mining; Machine Learning Algorithm.

ABSTRACT: The widespread of using information technology and the ease of making them available are leading to inflate amount of data massively, but in random form. Thus, there is a need to develop tools and concepts that have an ability to analysis, and extract knowledge, because conventional ways (statistical approach) do not have ability to deal with that massive amount of data. The machine learning will be focused in this paper in order to understand the main algorithms that are using to mining personal data that are obtained from different sources such as wearable devices and smart phone. In addition, the main challenges that are being faced several of studies through mining personal data. Keywords Wearable; Personal Data Mining; Data Mining; Machine Learning Algorithm.

1. INTRODUCTION One may wonder how the computer carry out tasks, which may seem tough on the machine at first glance, and the others may seem impossible. For example, face recognition; identify speech and calligraphy; the self-driving cars; robots moving and many other applications. Through this paper, we will learn about the concept of machine learning. Machine learning (ML) can be identified as the science that allows machine (e.g. computer, smartphone and wearable device) to act without being preprogrammed to do this act explicitly. In other words, learn how to respond to certain events in the right way autonomously without explicitly learned that before by programmer [1]. It worthily noted that the machine learning is a part of artificial intelligence, as it “set of methods that can automatically detect patterns in data, and then use the uncovered patterns to predict future

data” [2, p. 1]. The engineering reasons of why the machine has to learn, which are adaptive purposes, extract important correlation and relationships, which are hidden in a big scale of data (i.e. mining for data in data warehouse), and jobs improvement, highlighted by Nilsson [1]. Furthermore, there are different disciplines that helped the machine learned such as statistics, brain, psychological and evolutionary models, and artificial Intelligence. Obviously, the machine only understand the computational structure. Thus, Nilsson [1] outlined four possible structures, which have to be learned for machine, such as function, finite-state machine, logic programs, and systems of problem solving. In addition, it is worth mentioned that the machine learning are used statistical theory to building mathematical models, in order to reach to certain conclusion (e.g. predict, recognize) from a sample. Thus, in this paper, we will discuss the main algorithms of machine learning, which are used to deal with personal data. As well as, the main challenge in term of data mining which are collected from devices such as wearable computer, and smartphone.

2. BACKGROUND

2.1 Types of learning: At the beginning, as any system (algorithms or program), there are input, and output to reach to machine that is learned. Input: the initial values can obtained by support vector machine, which are called attributes, components, and feature either order or unordered (e.g. {large, medium, small}). As well as, the vector might has the name of attribute and the value at the

same time, for example (Sex: male, age: 19, weight 65 KG) [1] and [3]. Output: there are different forms for output such as real number, which result from function called estimator, categorical value, and Boolean number [1]. Generally, there are different types of learning that are classified according to algorithms' outcome. Precisely, Ayodele [4] classified the learning of machine into four types, while Murphy [2] into two types

a) Supervised learning:

A learning can called a supervised where a function are generated by an algorithm maps inputs in order to achieve desire outputs (i.e. approximate the behavior). The function maps the input's vector into several classes, and a learner (e.g. system) has to learn this function, for example face detection, and identical data. In other words, the classification is a stander formulation of supervised learning [4]. However, regression is another learning approach labelled under the supervised learning. The regression is similar to classification, but it is to predict continuous values rather than discrete categories [1], for example predict tomorrow stock market [5], and predicted temperature inside building [4] and [6].

b) Unsupervised learning:

However to supervised learning, unsupervised learning appeared much harder, because it tries to train machine through the input data without any pre-defined of desire output, and the goal here is to develop and predict new models and hidden relationships between data [4]. However, it is exceedingly applicable and typical more than supervised due to unrequired label data (i.e. unsupervised does not need expert of human to label data which result in large information) [2]. Furthermore, as the supervised learning, the unsupervised has several form of learning such as clustering that sort inputs into unknown groups in advance. An example for clustering is learning Event Patterns for Gesture Detection [7].

c) Semi-supervised learning:

This type of learning is a mix of labelled and unlabeled data (feature or pairs) in order to generate a classifier and appropriate function. Semi-supervised learning tries to reduce human efforts (labelled data problem) and high accuracy achievements (unlabeled data problem). Example of this approach is identify the

peptide group in shotgun proteomics datasets [9]. d) Reinforcement learning It is less commonly used. In this type, a police are learned in order to act after an action. In other words, signals are symbolized to reward or punishment based on current behaviour [2]. As well as, it defined by characterizing a learning problem instead of characterizing learning methods. Thus, reinforcement learning provide an interaction learning approach [4], and [10]. Examples of applications that are using the reinforcement learning are 'Improving elevator performance using reinforcement learning' by Crites and Barto [11].

It worthily mentioned that there are other machine learning classifications, which are basic and sub, such as Transduction, and Learning to learn. Transduction is almost identical to supervised learning else explicitly construct a function. In other words, it tries to predict new outputs according to training inputs [4].

2.2 Personal data

The widespread use of information technology (smartphone, and wearable) and the ease of making them available are inflated size of the information in a proactive manner, which led to massive data issue. To be precise, Swan [12] stated that the number of devices linked to internet are exceeded the number of the people on the internet, and in 2020 will be about 50 billion users. Data that are obtained from the personal sensing devices (e.g. smartphone, and wearable) called personal data. Furthermore, these technology are gives an opportunity to collect the data about human life (the bodies and daily activity) [13]. However, these vast amounts of data are still unemployed, and there is a need to automated methods such as the machine learning to use that deluge of data [2]. Nevertheless, before that, data mining approach called to explore, analysis, and extract hidden knowledge and essential information. Logically, in this paper we will discuss the main challenge of personal data mining, then algorithms of machine learning, which are use knowledge that mined from personal data.

2.3 Personal data mining

Personal data mining (PerDM) is a new approach, which is depend on the data mining concept, utilized to extract knowledge from personal data of users in order to achieve their needs [14] & [13]. PerDM has two purpose which gained a maximum benefits from personal data, and security and preserving privacy in order to create healthy lifestyles which are well managed. Liew et al. [13] commented that there is a "rapid growth can be observed in

the development of data mining technologies and algorithms”, which can evidence by Exploring data by Choe et al. [15]. While, concerns about security and privacy-preservation has raised strongly, due to the widespread of personal data in pervasive and ubiquitous environments [13].

2.3.1 Data source:

Personal Sensing Devices (PSDs) (e.g. smartphone / wearable) gives an opportunity to hand of heterogeneous streams of data from non-sensory and sensory sources. These heterogeneous data (sensing source) include physiological information, sensing contextual, environments, and locations. While the non-sensing and generate streams of multifaceted data stream [13]. In addition, a collector, which is mobile sensor-processing engine (MOSDEN), developed sophisticatedly to sense in Internet-of-Things environments [16]. An advantage of PSDs working as a platform for data processing in order to reduce computational operations by making the initial processing remotely at the user’s locality [12] & [13].

2.3.2 Discovery and management of knowledge

Gaber et al. [16] outlined three steps to extract knowledge. Firstly, data pre-processing which carry out several stages such as pipelining strategies and data fusion, anomaly detection, outlier detection, dimensionality reduction, and feature extraction. Secondly, use of the data mining (offline) algorithms or algorithms of data stream mining (online) such as clustering and classification in order to extract hidden patterns (knowledge). It is worthily mentioned that select of the data mining, and stream mining algorithms depends on application whether online or offline analysis [13]. Finally, evaluation of patterns of interesting knowledge, which are discovered, facing against interestingness measures to make a decision either discard or store. In addition, in order to manage data and reach to beneficial datasets aggregation, integration and summarization are carried out.

3. MAIN CHALLENGES OF MINING PERSONALDATA

The rapid growth of smartphone and wearable device through last 10 years result in increased attention to personal data mining in the research community, in an attempt to develop algorithms which are scalable and adapt with significantly increasing amounts of data. In order to search for a meaningful cognitive patterns. As well as, entered in various fields of life such as medical,

technology and economic [2], [12], [13] and [14]. Thus, in this section, we will examine several challenges raised in term of personal data mining perspective, and point out several studies in this area. At beginning of data mining approach, Jun and Siau [18] claimed that the “data mining continues to attach more and more attention in the business and scientific communities” [p. 1]. As well as, they pointed out several challenges. Firstly, various types of data (e.g. multimedia, hypertext and spatial data) are increasing burdens with handling these types effectively. Thus, data mining approach tend to build a system (algorithm) which able to mining knowledge (interesting, and reliable) in specific type of data. Secondly, these algorithms should be acceptable and predictable as long as increasing of database. Finally, protection and privacy issues, due to different angles of viewed and level of abstraction. Furthermore, dirty data, which is data contents errors result from duplicate record or outdated data, being as a challenging issue in term of mining personal data especially in term of business users. Data minors are trying to provide inputs that are skipped this problem. Visualization and descriptive statistic are used by the data minor in order to understate and identify the problems [27].

Additionally, there are several studies target the mining in personal data especially, healthcare. Sow et al. [19] stated that the major challenge of mining personal data resulted from sensor device are collection data, pre-processing, transformation, and formation and evaluation. These operations are carried out by data mining algorithms, which are classified by [1], [2], [4], and [20]. However, Banaee et al. [21] claimed that the there is a lack in algorithms which are handling special characteristics of personal data from health monitoring system. Therefore, a deeper focus is targeted in order to represents mining task to achieve a deeper knowledge. These tasks tries to predict, detect anomaly, and make a decision. In the same context (health care monitoring), other studies such as Ahmed et al. [22] focused on amount of reliable between user of systems and data which are analysed by the system, in order to rise the trust level of the system. However, trust amount of experts who use the system still insufficiently in term of reactive and proactive decision which are made by system [21]. Furthermore, naturally, security and privacy are the common concerns of the technology. Users of the smartphone and wearable devices are interested where this data will be going and who will have access to this data [13]. However, Fawcett [2], point out that the data, which are collected, store in end-database. As well as, it is obviously mining this data will be in the same platform,

and types of data are collected are not required hide the anonymization. Thus, Fawcett [2] summarized that the discovery of personal knowledge does not need security risks or new privacy. Real-time data is one of the main challenges of the mining personal data. There are several of studies targeted scalability issues of collection of real-time data [25] and [26]. In which, processing data stream (data mining algorithm) in such way congruent with resource of computational, screen real-estate, and considerations of the mobile device (smartphone/wearable) (i.e. energy consumption and heating mission).

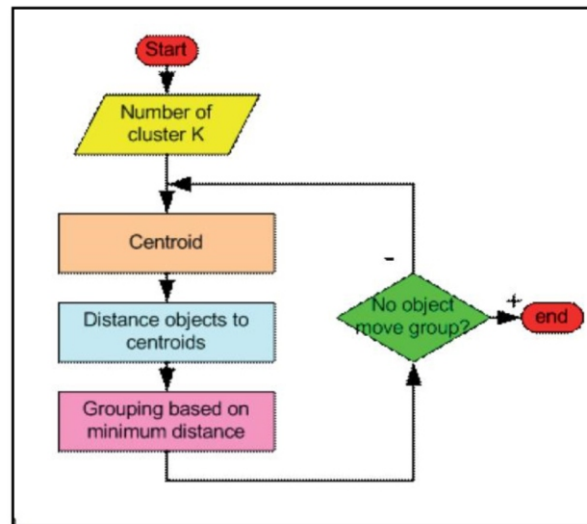
4. MACHINE LEARNING ALGORITHMS

Generally, there are many algorithms of machine learning that are in different capabilities in order to deal with various types of problems. As mentioned above in (section 1.2), there are two major type of leaning, and these algorithms are ranged between these type of leaning. In addition, cover all machine-learning algorithms in this paper are difficult. Moreover, in order to reach to the feasibility and faithfulness of discussion and evaluation, we will choose the most important algorithms according to types of learning and type of work (i.e. classification or clustering). Furthermore, at the end of this section we will list several of machine learning algorithms, which have not mentioned through the following section.

4.1 Clustering algorithms: It is a process of clustering whole data into multiple groups with high similarity (i.e. clusters or group of dissimilar data points). These algorithms carry out clustering by divided datasets into several clusters in which similarity between the points within a certain grouping great than the similarity between two points within the different two communities. Precisely, summarizing vast amount of data into groups or categories in order to facilitate process of analysis [13].in addition, clustering algorithms are using different techniques of clustering, which are spectral, hierarchical, subspace, centroid and density [13]. Worthily, clustering algorithms are using unsupervised learning numerously [28]. However, Liew et al. [13] stated, “limitation of insufficient resources is a bottleneck that hampers the maximization of these algorithms” [p. 18]. K-means is one type of clustering algorithms:

4.1.1 K-means algorithm This algorithm are being used to cluster data into several categories depending on their characteristics to K clusters. Clustering process tries to reduce the distance between the data and centroid cluster [13]. Ayodele [4] demonstrate the k-means algorithms into three steps, which are determination a center coordinate, determination a

distance between each objects and center, and cluster the object according to minimum distance. To be precise, k



centroids are defined, which are one for each cluster, and put these cannily due to different location mean different results. Thus, these centroids have to be placed far away from each other in order to clear results. Then, try to associate each point (within a data set) with nearest centroid until there is no pending point. The figure 1 below demonstrate the k-mean algorithm procedure [4].

Figure 1. K-means algorithm.

In addition, Marsland [29] started that the k-means algorithm has ability to deal with noisy of readings data. However, this feature are depends choosing of clusters correctly (i.e. replacing the each noise by cluster centre). Furthermore, Xu & Wunsch [28] described that the time complexity of k-means algorithm is near to linear ($O(N)$), and it is work effectively with large scale of datasets than the hierarchical clustering (quadratic computational complexities). In the contrary, it is sensitive to initial value (i.e. select different initial value produce different results) [28] & [13].

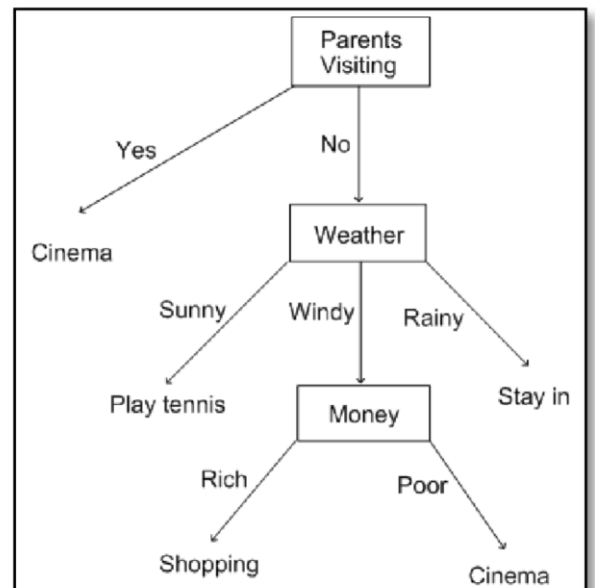
4.2 Support Vector Machine algorithms (classification and regression):

One of the most distinct and powerful algorithm that are using supervised learning approach is a support vector machine (SVM). SVM are being used in term of

classification, and regression sets of variables based upon Statistical Learning Theory [29], [34] & [30]. An n-dimensional hyper-plane are constructed in order to carry out a classification that are separate the dataset into two group optimally (separated by margin), and these two layer are a perception neural network. Furthermore, SVMs are gaining character of multi-layer perceptron classifiers, alternative training method for polynomial, and radial basis function by using the function of kernel. In other word, by solving a problem of quadratic programming (with liner constraint) gives ability to find networks' weights [4] & [30]. It is worthily mentioned that the extraction of features are carried out by transformation the attributes to produce vectors, and the vectors that are near to the hyper plane known as support vector [3] and [4]. Furthermore, SVMs have a flexibility to select a form of the threshold between the two groups (e.g. linear or non-linear but non-parametric) and not the same for all data. In addition, Murphy [2] claimed that the SVMs are 'very unnatural' in term of probabilistic because SVMs encode sparsity and kernel by using algorithm trick, and outputs not resulted probabilistically which are lead to difficulties particularly in multi classification form. Moreover, Auria & Moro [31] showed that the SVM algorithm produce results effectively in high dimension space. However, large datasets might increase the time performance due to higher training time (i.e. time complexity of training time = $O(n^2)$) [32]. In the contrariety of k-means, Natarajan et al. [33] claimed that SVM does not perform well with noise due to classes overlapping [33].

4.3 Decision tree (DT) algorithms:

A DT is a natural and classic model of learning that is related to the essential notion of computers science 'divide and conquer' [37]. DT is one of the most popular and powerful algorithms to classify and predict patterns from available data in machine learning approach [13], [37] and [38]. It can be seen DTs successfully in several area such as signal classification [35], and remote sensing [36]. DT is an exploratory form appears in the form of a tree, and each branch represent a question taxonomically, while leaves refer to patterns, which are built from datasets. The basic rule in building a decision tree is to find a better question in each branch of the tree. Consequently, the question divides data into two parts. First part answers the question while the second does not. Therefore, the decision tree will be built through sequence of questions [37] and [39] (see figure 2). To be precise, Safavian & Landgrebe [37]



summarized the decision tree procedure into three steps, which are splits selection; determine terminal node (answers); and training the terminal nodes (i.e. labelling class). Furthermore, Rokach & Maimon [39] outlined several decision tree algorithms such are ID3, C4.5, CART, CHAID. In the following two sections, ID3 and C4.5 will be discussed.

Figure 2. Example of a decision tree.

4.3.1 ID3 algorithm:

ID3 is a simple form of decision tree and widely use in term of classification [29] & [39]. Information gain are used in this algorithm as splitting criteria of features to produce a classifier (a decision tree) recursively from high level to low level. The recursion procedure cease when either no feature left or remain only one class in the data [29] & [41]. In addition, Suh [29] demonstrated the resulted decision tree as "leaves represent the classes and the internal nodes represent the attribute -base tests which are connected with the branches that represent the outcome of each test" [p. 100]. It is worthily mentioned that the handling noisy data is powerful feature for ID3, due to high level (certain degree) of heterogeneous. However, Rokach & Maimon [39] outlined several backward such as The difficulty of determining the depth of the tree over-classified (over-fitted) due to testing small

sample, limitation test (i.e. testing one sample at a time to predict decision), and deal with continuous data is computationally expensive [29] & [41].

4.3.2 C4.5 algorithm (Associations):

C4.5 is one of decision tree algorithms that are updated of ID3 algorithm to deal with ID3 weaknesses. However to ID3, C4.5 tries to generate decision trees with known depth; deal with continuous data (e.g. temperature degree); process data that are content missing value, and improved the computational performance of previous algorithm [39] & [41]. In addition, C3.5 are using a concept that are called gain ratio by applying an entropy concept. Gain ratio is an extra feature to the criteria of attribute selection (i.e. splitting criteria). This algorithm carry out calculation of entropy for a class S that might contain a separating node, which are a node are separating a collection of data T to several subsets ($t_1, t_2 \dots t_k$) in order to calculate the gain ration. Then, gain ration will be calculated. This operation are iterated for each class until find the class with high gain ratio. Therefore, initial tree are generated through training tests [41]. At present, Liew et al. [13] claimed that the c4.5 are a significant algorithm to deal with noisy and complex data such as medical domain due to making a right decision [43].

4.4 Artificial Neural Network algorithms (ANN): ANN is a one of the methods that are used to mining data through simulating the human neural network. ANN are processing data in distribute and parallel manner massively in which store knowledge of practical experiential and experimental information in order to make an effective decision. The basic idea of ANN is to acquisition knowledge by number of training process and store this knowledge by using lattice of weights. In term of architecture, numerous of processing unit called neurons structured the ANN. In addition, as any system, the ANN has input units, processing unit (store and recognize), to generate outputs (prediction) [41], [43] and [45]. Suh [41] describes the structure of ANN that are consist of three different layers (i.e. set of node for each layer). To be precise, input layer (set of nodes accept patterns of input), hidden layer (nodes receive inputs' layer result to carry out extra computation), and output layer (set of nodes carry out operations in order to give output to user). Furthermore, these layer use three data of datasets, which are training set, validation set, and test set. Generally, ANN gives a lower amount of error of classification, and high level of robustness comparison with decision tree algorithms. However, time of creation is longer than

decision tree algorithms [41]. Furthermore, ANN are being used in different area such are pattern recognition [46], clustering [47] and prediction such as prediction of stock market returns [48], and weather forecasting [49] by using different model (algorithms). Suh [41] outlined several algorithms ranged between supervised and unsupervised learning. Therefore, the following section will explain two major algorithms of ANN.

4.4.1 Perceptron algorithm:

One of the supervised learning algorithm is a perceptron. It is a first algorithm that are simulate the neural network. Perceptron is a simple form of Feed-Forward Neural Network (i.e. each neuron are feeding itself or others). Architecturally, it has two types, which are single layer, and multi-layer perceptron [45].

a) Single layer perception

It is called linear classifier. In the other meaning, this algorithm tries to solve problems that could be separated lineally, and it has input layer with only one neuron. Each neuron carry out a classification of input vector in two categories. Thus, the output will be either 1 or 0 [50].

b) Multi-layer perceptron

This type has multiple neurons, and each neurons has one decision boundary. However to single layer type, this type can classify the input into numerous categories, and different output vector represent each categories [50].

Furthermore, perceptron algorithm tries to train elements by training set once element at a time (online algorithm). As well as, it use thresholds and weights(either positive or negative) in order to reduce the error of predication in which actual outputs are compared with desired outputs a function which are called error function. It is worthily notice that perceptron algorithm are being used by several studies such as Le & Van Nguyen [52], and Batten [53]. Eventually, Watts [51], who is expert in Computational Intelligence, claimed that perceptron are efficient algorithm, and address linearly separable. However, it does not deal with non-linearly separable.

4.4.2 Back-propagation algorithm (BP)

BP is a one of the major algorithms that use ANN approach and it an iterative gradient algorithm. BP has been designed in order to reduce the 'mean square error'

between the desired output and actual output. As well as, it carry out a classification process through vector of training data [1], [41] & [54]. One advantage of BP algorithm, which was claimed by Suh [41], are ‘deal with incremental training’. In other meaning, the algorithm are updating the weights after processing of each case. However, these weights are not assemble in fixed point in the function of error. Thus, the rate of learning process has to be slower in order to successful convergence. Furthermore, Cilimkovic [54] analysis the algorithm in four steps which are feed-forward computation; back propagation to the output layer; back propagation to the hidden layer; and Weight updates. Worthily, when the error function value has become adequately small, the algorithm is cease. Therefore, BP algorithm is flexible and process in parallel. Consequently, lead to reduce time of computational [41]. However to above, local minima occurs during the processing due to changing the weights, and adjusting large values of weights during the training might result in

	Algorithm	Type of learning	Reference
1	Linear Regression	Supervised learning	[58]
2	K-nearest Neighbors	Supervised learning	[1]&[59]
3	Naive Bayes	Supervised learning	[59]
4	Apriori	Unsupervised learning	[60]
5	Fuzzy Clustering	Unsupervised learning	[61]
6	Q-learning	Reinforcement learning	[62]

network paralysis [55]. Recently, this algorithm are being use in several studies such as Manalo et al. [56], and Thanammal & Sudha [57].

4.5 Other algorithms

In addition to section 4, there are others algorithms, which are being used in machine learning field, that were not mentioned. Therefore, following table refers to several of those:

5. CONCLUSION AND RECOMMENDATIONS

Ultimately, this paper has introduced an overview of main concept of machine learning approach by outlined the major types of learning that are classified according to type of desired outcome. These are supervised, unsupervised, semi-supervised, and reinforcement and other (section 2.1). As well as, the widespread use of information technology (smartphone, and wearable) and the ease of making them available are inflated size of the information in a proactive manner, which led to massive data issue. Thus, machine-learning algorithm are being focused significantly by large number of studies in order to propose algorithms that are mining vast amount of data perfectly to achieve knowledge. As well as, this mining in personal data are faced several of challenges ranged between many issues such as efficiently, privacy and accuracy. Therefore, planning data mining operation lead to accuracy results. In other words, determine the problem and desire outputs; build datasets; and select a suitable algorithm that is success the goals. Algorithms of machine learning are numerous and differ in duty and approach. Precisely, classification, clustering and association are the major approaches of machine learning algorithm. As well as, they represent the data in various form such as vectors (see section 4.1 and 4.2), decision trees (section 4.3) and neural network (section 4.4). To sum up, the machine learning considered emerging science strongly, and it is expected to play a critical role in many of the smart applications in the future in addition to his current role in influencing numerous areas in our lives without even know. As well as, Internet of Thing (IoT), which is “The general idea of things, especially everyday objects that are readable, recognizable, locatable, addressable, and controllable via the Internet” [cited in 14, p. 218], increases a burden of machine learning algorithms to deal with that features. Thus, there is a need and more focus of using machine-learning algorithms in order to add smart features devices that are under the IoT term.

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RUKMA VIMANA PROTOTYPE

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Abstract: Ancient ancestors had 12 strand DNA, hence had more intelligence than modern humans. Sanskrit documents contain advanced science and technology in them, which are documented by ancient ancestors. In the process of giving their valuable information to the next generations of human race, Maharshi Bharadwaja and several other ancient scientists or Rishis provided us Texts like Vimana shashtra. This paper describes modern day rediscoveries and reinventions from Vimana shashtra. Our team SWASTIK (Scientific Works on Advanced Space Technology Investigators for Knowledge) is group of researchers working on lost advanced ultimate ancient technology. SWASTIK team works on different types of vimana to make vimana prototypes, their propulsion systems, modern software works such as 3D modeling design of vimana and aerodynamic, thermal analysis, and ancient materials properties for advanced space radiation are described in this paper. Rocket Launch Technology of ancient ancestors are more highly advanced than compared to modern technology. Raja Loha, a high-heat-absorbing alloy used for the bodies of various flying crafts, preparation, and properties of each material in its compositions are also mentioned in the paper and also describes our research works on Rukma vimana, which reveal that it is an advanced interplanetary Vedic space vehicle.

Keywords: Vimana, Antigravity propulsion, CFD analysis, Thermal analysis, Rukma vimana Prototype.

1. INTRODUCTION

There are three types of Vimanas mentioned in Vimana shashtra, classified depending upon the importance: Maantrika, Taantrika and Kritaka. All these are described and designed by analysing the resources available in earth and also depending on the Human intelligence. Rukma Vimana is one of the Kritaka Vimanas and it is similar to a rocket. Rukma Vimana had long vertical ducts with fans on the top to suck air from the top and send it down the ducts, generating a lift in the process. Utilization of electrical energy to operate Electro-Mechanical arrangement to enable vimana to lift off and accelerate Directional control is through conventional rudder system provided at the base ^[1].

The following points are important events in history describing modern day works on ancient Sanskrit texts:

- 1) According to ancient astronaut theorists, Buddha had extra-terrestrial contact and visited to earth from Vimana, and when Ashoka was educated by Buddha, he had to hide the knowledge and keep it secret to avoid world's destruction by Evil people. Ashoka and secret society of 9 unknown men is still a mystery. Shivkar Bapuji Talpade, was Sanskrit scholar during the British rule. He made attempts to reconstruct ancient vimana using ancient propulsion. Maharaja of Baroda witnessed

the event of flying his Marutsakha vimana. Later some of the witness and his vimana were destroyed by evil people. Before World War II, Hitler and his team worked on Ancient texts which include Ancient Indian Sanskrit texts also. Nuclear weapons, Mercury vortex engine and Bell shaped flying object named De Glocke have been similar to ancient Indian technology. Few years after the war, blue prints of Antigravity Flying machine were found.

- 2) NASA recorded the Sacred Hindu OM Sound from Sun's atmosphere. Ancient Sanskrit texts mentioned that sun chants OM, and some texts describe that every atom bonds with another atom with the frequency of sound OM. Sanskrit is declared as the perfect language and can be used in Artificial intelligence^[2].
- 3) Nikola Tesla was influenced by Swamy Vivekananda and learnt Sanskrit terms from him to read the texts. He tried to invent many things mentioned in ancient Indian technology texts and took patents. Some of his inventions are Aerial Transportation vehicle which is similar to Rukma vimana and also Tripura Vimana. This is VTOL aircraft. There are free energy Motors and generators mentioned in Vimana shashtra. According to the studies, Tesla tried to invent Free energy generators^[2].
- 4) Modern scientists reinventions from Sanskrit texts indicate the value of texts. CSR Prabhu invented

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following things: Materials such as Raja Loha, Tamogarbhaloha, Pancha Loha, Araara Tamra, and Badhira Loha. Glasses such as Vidyutdarpana, Ravishakti apakarshana Darpana, Ushna Shakti Apakarshana Darpana and Vimana Device, Vakra Prasarana Yantra. Professor Sharon Invented Chumbak Mani and N. G. Dongre invented Dhvantapramapaka Yantra. Ancient Nano technology related inventions are done and by Sri Maharshi Research Institute of Vedic Technology. They invented a novel process of preparing nano metal and the products thereof^[2]^[3].

Throughout the history there have been attempts to reinvent ancient Indian technology, and now in the 21st century humans are successful in reinventing. Hence proving the texts as non-mythological and high advanced technological. Our team SWASTIK- (Scientific works on Advanced Space technology Investigators for Knowledge) is group of researchers working on Vimana technology^[4]. Rukma Vimana's Manufacturing, Structures, propulsion, aerodynamics, Space mechanics are described below.

2. RUKMA VIMANA STRUCTURES

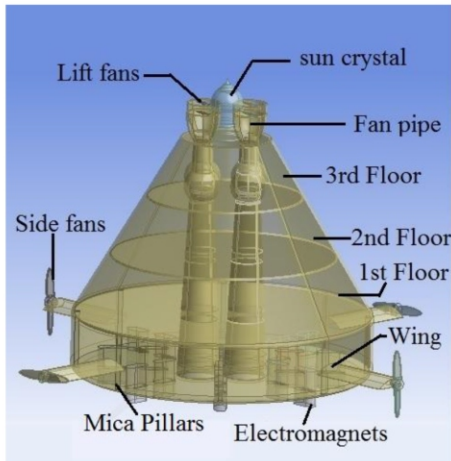


Fig.1. Various parts of vimana

The 3D model of Rukma vimana is developed based upon descriptions of Vimana in Sanskrit texts and also by referring to Drawings made by Yellappa guided by Pandit Subbaraya shasthry.

For 3D modelling, Rukma vimana is divided into following parts:

- 1) **Rukma Vimana main body:** All the floors of vimana are 20 feet high, ground floor containing landing gears, electromagnets and wings. Whereas remaining floors are passenger cabins. According to Vimana texts, third floor is used as cockpit for

pilots. There are goblet shaped cup like structures at the top of vimana in order to fix propellers or lift fans inside them to suck the air from top. Sun crystal is Dome shaped on the top of vimana third floor placed in centre of all the goblet shaped cups. There are four Wings of vimana around the circumference of the ground floor. There are slots provided for locating the Electromagnets in assembly.

- 2) **Propellers:** There are 8 propellers for Rukma vimana

Table1: Vimana Propellers Details

Propellers	Location	Purpose
4 Lift Fans	Above third floor of vimana, in goblet shaped cup like structures	Sucks air from top of vimana for lift
4 Side Fans	At the end of 4 Wings extension with movable mechanisms	for VTOL and direction control of vimana

- 3) **Fan pipes:** Wires run through fan pipes from 4 lift fans or propellers and are connected to motor at third floor of Vimana.
- 4) **Mica pillars:** 8 Mica pillars are located at ground floor of vimana, pillars are 20 feet long support from which third floor is constructed.
- 5) **Electromagnets:** There are 8 pairs of electromagnets arranged 45 degrees from central axis of each pair.

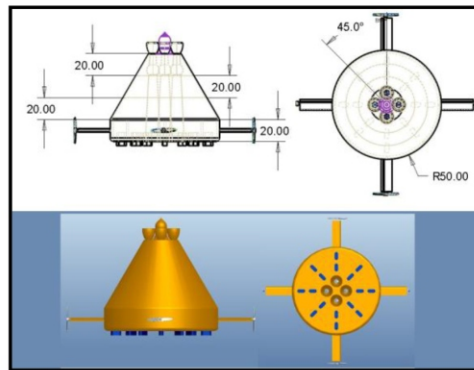


Fig.2. Assembled Rukma Vimana and Dimensions^[6]

3. MANUFACTURING MATERIALS

RajaLoha is used to make Rukma vimana, this material is deciphered by modern day scientist CSR

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Prabhu. RajaLoha means king of all metals. The term RajaLoha was used for the resultant material obtained by combining various metals and herbs. In order to protect from heat and radiations, the alloy was used for the bodies of various flying crafts in ancient times.

Raja Loha material compositions and descriptions:

- Ammonium chloride: NH_4Cl
- Bengal gram:

Table2: Bengal Gram Composition

Constitute	Composition
1) Calorific value	350 (cal./100 g)
2) Crude protein	26.2 percent
3) Fat	1.2 percent
4) Carbohydrate	56.6 percent
5) Calcium (mg)	185 (mg./100 g)
6) Iron (mg)	8.7 (mg./100 g)
7) Phosphorus (mg)	345 (mg./100 g)
8) Vitamin (mg)	
a) B ₁	0.42 (mg./100 g)
b) B ₂	0.37 (mg./100 g)
c) Niacin	2.0 (mg./100 g)

- Lodhra plant: It is used in RajaLoha to protect the humans inside the vimana from diseases caused by Space Radiations.
- Benzoin: $\text{C}_{14}\text{H}_{12}\text{O}_2$
- Lead: $[\text{Xe}] 4f^{14} 5d^{10} 6s^2 6p^2$
- Sea-foam: Sea foam, ocean foam, beach foam, or spume is a type of foam created by the agitation of seawater, particularly when it contains higher concentrations of dissolved organic matter (including proteins, lignins, and lipids) derived from sources such as the offshore breakdown of algal blooms.
- Iron pyrites: The mineral pyrite, or iron pyrite, also known as fool's gold, is an iron sulphide with the chemical formula FeS_2
- Iron: chemical element with symbol Fe (from Latin: ferrum) and atomic number 26. Electron configuration $[\text{Ar}] 3d^6 4s^2$
- Mercury: Electron configuration $[\text{Xe}] 4f^{14} 5d^{10} 6s^2$
- Natron, NaHCO_3
- Salt-petre, KNO_3
- Borax: $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
- Mica: Chemically, micas can be given the general formula $\text{X}_2\text{Y}_{4-6}\text{Z}_8\text{O}_{20}(\text{OH},\text{F})_4$ in which

X is K, Na, or Ca or less commonly Ba, Rb, or Cs;

Y is Al, Mg, or Fe or less commonly Mn, Cr, Ti, Li, etc.;

Z is chiefly Si or Al, but also may include Fe^{3+} or Ti. Structurally, micas can be classed as dioctahedral (Y = 4) and trioctahedral (Y = 6). If the X ion is K or

Na, the mica is a common mica, whereas if the X ion is Ca, the mica is classed as a brittle mica.

- Silver: Electron configuration $[\text{Kr}] 4d^{10} 5s^1$
- Aconite: $\text{C}_{34}\text{H}_{47}\text{NO}_{11}$
- 5 sweets: curd, milk, ghee, sugar, honey mixture give result in golden colour thick paste.

After observing the composition we can understand that ancient manufacturing process was also eco-friendly and because of the extinct plants/trees in modern day, we will have to replace them with other substitutes which can be similar to it. In order to understand the Vimana materials and similarities with modern available materials, our SWASTIK team did Thermal analysis on 3D model of Rukma vimana. Each time different material is used for the vimana, such as Copper, silver, gold, mica, titanium, tungsten and ceramics. Input values taken are: Heat Flux = 500 W/m^2 , Convection = $500 \text{ W/m}^2 \cdot ^\circ\text{C}$, Radiation = 1, Temperature = $1000 \text{ }^\circ\text{C}$. Convection and Radiation are applied to all faces of vimana but Heat flux is applied to the shell part of three floors of vimana where the passengers and pilots are seated.

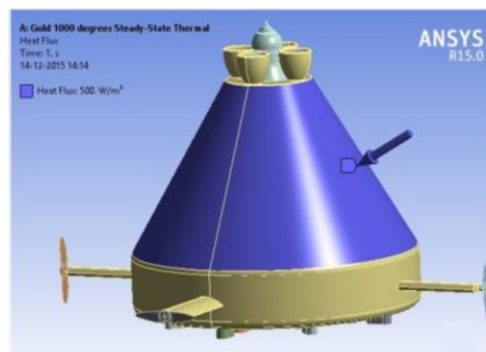


Fig.3.Rukma vimana Meshing and Heat flux applied on passenger cabin surface [7]

Table3:Thermal analysis results

Metals	Max Temperature	Max Heat Flux	Max Directional Heat flux
Copper	1001	540.41	430.89
Copper alloy	1001	521.23	431.6
Silver	1001	543.71	451.14
Gold	1000.6	428.7	329.2
Mica	1001.1	2.8175	2.1121

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Titanium alloy	1001	120.03	78.249
tungsten	1001	372.48	243.67
Ceramics	1001.1	34.146	23.418

By observing the results of CFD analysis, Velocity at the bottom of Vimana is found to be greater than that of Rocket.

Table5: Values of CFD results

	Location: At The Bottom	
	Velocity range (m/s)	Static Pressure Range (Pascal)
Vimana	2.73e+002 to 4.10e+002	-3.98e+04 to -5.93e+04
Rocket	7.28+01 to 3.64e+01	-8.79e+02 to -1.23e+04

The mixture used to make Raja Loha has mica which gives less heat flux compared to ceramics. The proportions of silver, mica, lead, mercury and other materials would result in raja loha which would have properties similar to that of NASA space shuttle heat shield tiles. When these mixtures are taken in exact proportions mentioned in texts we get the perfect raja loha and it can be used for Modern space vehicles.

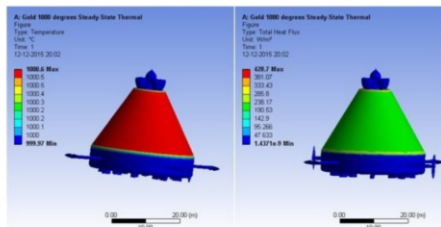


Fig.4. Thermal analysis Results of vimana when material is gold.

4. AERODYNAMICS

Computational Fluid Dynamics Analysis is carried out for Vimana model as well as Rocket model with the same input values: Gauge pressure, Mach number and Velocity

Table4: Input Values for CFD analysis

Vimana and Rocket Model input values	Gauge pressure	Mach Number	Velocity
	0	0.6	208.2526

Vimana and Rocket Analysis Results

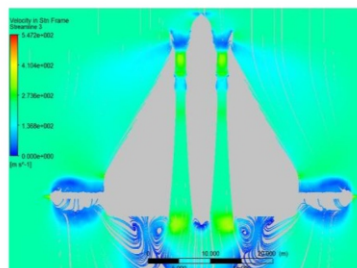


Fig.5. Velocity Streamlines of Rukma Vimana and Rocket

5. PROPULSION

- 1) Rukma vimana extracts electricity from sun through sun crystal located at the top of vimana^[5]. Sun crystal absorbs more electricity from the sun when compared with modern-day solar panels. Hence it was more efficient and advanced than solar panels known to us. The procedure of electricity extraction from sun, has been deciphered by our SWASTIK team. The 4 electrodes, electrolytes, acids located inside the sun crystal perform electrolysis process and supply to the motors of vimana through fan pipes in which electric wires are contained.
- 2) There were no space vehicles at the time when Yellappa drew the vimana diagrams guided by subbaraya shashtry. There are electromagnets mentioned in the Figures of vimana, which are earlier than today's NASA news that says "Electromagnetic drive propulsion is possible" Nikola Tesla made attempts to create free energy generators and antigravity VTOL vehicles with the inspiration and reference of Vimana texts. Swamy Vivekananda helped Tesla to understand sanskrit texts and its technical terms^[2].
- 3) Tesla's works describe that excess electricity to an object will lift which is antigravity propulsion or levitation. Purpose of electromagnets in Vimana may indicate such type of propulsion. Tesla also worked on free energy concepts with the help of ancient Sanskrit texts. Vimana has motors and generators which is mentioned in vimana shashtra. Tesla's works on free energy generators and motors might give a clue on how the ancient ancestors tapped free electricity from ether. Free energy concepts have been neglected and avoided by many countries but recent invention from India describes free energy generator which gives more than 200% efficiency by taking power from vacuum.

Our works on Sun Crystal have shown us good

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results and given confidence that it is much more advanced than modern solar panels. Ancient advance solar power generation is a research platform working on methods of generation of solar power using ancient technology with advance knowledge [8]. Propulsion part of vimana is not decoded completely but after more research, modern humans may be able to reach it.

6. SPACE MECHANICS

The wing like structures of Rukma vimana are located such a way that it can be swept back and also rotated to act as a fin for vimana during VTOL. Numbering the vimana wings starting from positive X axis, clockwise manner numbering as described in following figure.

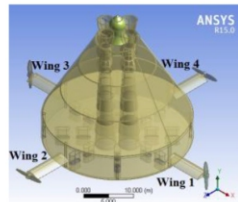


Fig.6. Vimana wing numbers for direction control description

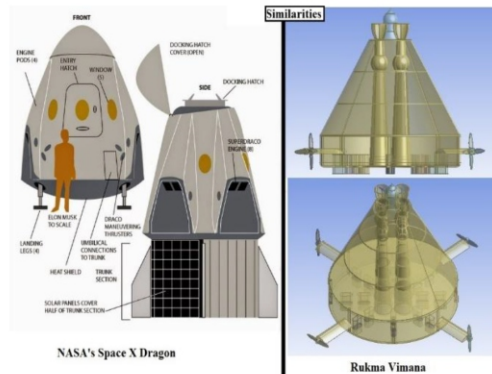


Fig.7. Rukma vimana and Space X dragon similarities

Table6: Vimana manoeuvres

Direction of movement	Wing number as shown in figure	Wing Rotation	Sweep back
+x	2 and 4	No rotation	-x direction
+y	1, 2, 3, 4	90°	-y direction
+z	1 and 3	No rotation	-z direction
-x	2 and 4	No rotation	+x direction
-y	1, 2, 3, 4	90°	+y

			direction
-z	1 and 3	No rotation	+z direction

The positive Y direction movement of vimana is VTOL. 4 Wings rotate 90° and act like fins of rocket by its sweep back positioning.

7. RUKMA VIMANA PROTOTYPE: MRV UAV

A 15/15 cm prototype of Rukma vimana has been designed by our SWASTIK team.

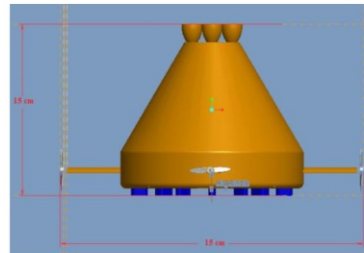


Fig.8. Rukma vimana Prototype model Pro-E design

In order to do practical works on Rukma Vimana and to implement the advanced features of Rukma vimana, in modern day UAV, starting with small scale projects, MRV UAV (Mini Rukma Vimana Unmanned Air Vehicle), using the scaled dimensions of Rukma vimana and propellers lift mechanisms with motors, propellers and batteries. Our Works on Rukma Vimana Prototype, MRV UAV Project was selected to National Aerolympics 2014, Aeronautical Society of India and Won best team award [9].

Parts of MRV UAV:

1. Lift fans: Lift fans are the main part of the UAV. They can be used to go through mountainous regions. And fans are preferred other than wings for Vertical take-off. The lift fans configuration is similar to Rukma vimana Mentioned in Vimanika shashtra.

2. Camera: The cameras can be used to record the video of path the UAV is going through or any disastrous incidents can be captured and help the situations.

3. Object collector: They can be used for defence purposes, delivering the medicine to the soldiers through object collectors.

4. Landing gears: The main purpose of landing gears is to make the UAV land in any desired location.

Advantages of MRV UAV in comparison with other UAVs are as follows:

- Based on Analysis for VTOL, UAVs are having lift fans embedded in Wings. But this MRV UAV has simpler configuration, enabling the UAV to lift off with fans provided at the top of the UAV directly connected to the base of UAV with the help of Ducts.

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- The Direction control can be achieved by operating the manoeuvring fans acting as propellers.
- The UAV can move 360 degrees in at mid-air in single position.
- It can not only land anywhere but also move on ground for various purposes^[10].

Mechanisms: The Vimana prototype is having 8 propellers. the propellers at the lower part, side fans are having movable mechanisms to make the VTOL of the Vimana prototype. The upper propellers or the lift fans are also enabled to produce lift. The wings add more lift to the prototype. Once the prototype is in air, the Wings can move to and fro to reduce drag force and maneuver as mentioned in table 6.

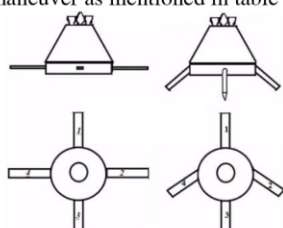


Fig.9.Rukma Vimana Prototype - maneuvers mechanisms

8. Rukma Vimana Lift calculations

Rukma vimana has Lift fans at the top, each 6 feet diameter. Calculations are as follows:

$$[EQ1]: PL [hp/ft^2] = power / A$$

$$[EQ2]: TL [lb/hp] = 8.6859 * PL^{(-0.3107)}$$

$$[EQ3]: Lift = TL * power \gg [lb] = [lb/hp] * [hp]$$

Using equation **one**, we calculate power loading (PL) of a 6 foot diameter (72") disk with 300hp absorbed.

$$PL = 300 / (\pi * 3^2)$$

$$PL = 300 / 28.27$$

$$PL = 10.61 \text{ hp/ft}^2$$

Using equation **two**, we calculate the thrust loading.

Typical communication/interpretation error is in the negative exponent of the equation, $X^{(-Y)}$ is the same as $1/(X^Y)$.

$$TL = 8.6859 * (10.61^{-.3107})$$

$$TL = 8.6859 / (10.61^{.3107})$$

$$TL = 8.6859 / 2.083$$

$$TL = 4.2 \text{ [lb/hp]}$$

Using equation **three**, we calculate the lift/thrust.

$$\text{Lift} = TL * \text{power}$$

$$\text{Lift} = 4.2 * 300$$

$$\text{Lift} = 1,251 \text{ pounds}$$

Lift = 5564.73 Newtons for Single Lift fan of Rukma vimana.

All lift fans; For 4 lift fans, the lift is; $4 \times 5564.73 = 22258.92$ Newtons

The side fans of Rukma vimana are 30 feet diameter each. 300 hp, 30' rotor develops 3,400 pounds of lift. 15123.95 Newtons lift for each propeller (side fan of Rukma vimana) All side fans; For 4 side fans, the lift is; $4 \times 15123.95 = 60495.8$ Newtons

Complete Vimana lift is Lift fans + Side fans = $22258.92 \text{ Newtons} + 60495.8 \text{ Newtons} = 82754.72$ Newtons In order to lift 100/100 feet vimana,

Now looking at the Modern day Heavy Transport Helicopter. Let us see the dimensions as mentioned in the following table.

Table 7: Dimensions of Heavy Transport Helicopter

Rotor Blades (main/tail)	8/5	
Tail Rotor Diameter	7,61 m	24 ft 12 in
Rotor Disc Area	804,2 m ²	8656 ft ²
Length	40,00 m	131 ft 3 in
Height	8,10 m	26 ft 7 in

Rukma vimana have wing structures, there are 4 wings which provide additional lift for the vimana. Moreover the drag caused in helicopter type vehicle is not there in the case of Rukma vimana because the lift fans are able to send the air on to hit the ground. As well as the side fans tilt and the air hit the ground directly creating good lift force. Another important factor we need to consider is, the Antigravity propulsion of Rukma vimana.

9. RESULTS AND DISCUSSION

When there are Reinvented devices and materials from vimana shashtra, then the Vimana technology cannot be neglected as it gives mankind to achieve more advanced technology. Some attempts of antigravity may fail due to improper procedures and materials, but when we follow the Vimana shashtra step by step and execute the process correctly, then we may decode the advanced technology. Modern scientists are able to understand the devices in vimana shashtra now and are reinvented. To Re-invent the vimana technology, modern humans need more

RUKMA VIMANA PROTOTYPE

research and development in order to reach the advanced space technology. In order to benefit the mankind by giving advanced technology and Free electricity from nature, and to make vimana initially in small scale as prototypes Lab tests, 3D printing of vimana prototypes, our SWASTIK team is looking for encouragement and support for solving financial constraints to complete our dream and innovation by funding our research work. The vimana prototypes planned by our SWASTIK team are Hybrid models of advanced ancient vimana technology and the modern cutting edge technology. After Analysing the 3D model, CFD analysis and Thermal analysis of Rukma Vimana, we can understand that perfect Reinvention of Ancient vimana may be impossible due to the lost resources (raided libraries) and unavailable materials such as extinct species of the Flora. Thus replacing this absence with modern technology we can make the vimana 50% modern and 50% ancient, resulting in advanced space vehicle.

MRV UAV works can be carried out in following ways:

- 1) 3D modelling design of MRV UAV
- 2) Prototype with modern technology: 3D printing
- 3) Wind tunnel tests and Improvements based on results
- 4) Levitation/ Antigravity tests using Tesla lift concept (Electromagnets, electricity & lift)

CONCLUSIONS

Rukma vimana Prototype, MRV UAV is going to be a Successful VTOL. The three floors mentioned in the Rukma vimana were used for passengers, but the mini Rukma vimana UAV can make arrangements of using such place in a scaled dimension, to embed the weapons, or missiles used for Defence purposes. In scaled dimension of UAV, the lower floor can be used for location of retractable landing gears, middle floor can be used for locating missiles and weapons systems inside the UAV and top floor can be used to set the cameras. The main advantage is the 360 degrees rotation of MRV UAV which becomes easy to attack the enemy planes from the back of the UAV. This can make the UAV to attack easily and also escape from enemy planes. Not only for defence purposes but also the same MRV concept can be used for other missions such as disaster rescue mission, the place inside the UAV can be utilized for Medical equipment (First aid) objects and also food for the victims. The bottom of the UAV can be designed such a way that it can be opened at the central part (other than landing gear belly) in order to unlock the container of medicine or food packets. Farmers have been facing many problems due to the unusual Weather conditions, there have been UAVs helping for this purpose also. But the main advantage using MRV UAV is, it has enough space inside it and simple configuration with VTOL

can provide much better facilities without the damage of UAV in worst weather conditions.

ACKNOWLEDGMENTS

Ancient Indian and Sri Lanka Ancestors Ravana, Rama and Krishna for giving us the History of their usage of vimana technologies in ancient times. The great sage Maharshi Bharadwaja for passing on the precious valuable treasures of knowledge to the generations. Subbaraya shasthry and Yellappa, who have done great work together trying to give pictorial representation of the vast ancient advanced technology space vehicles. Mr. G. R. Josyer, Director of the International Academy of Sanskrit Research, for translating the Vimana shashtra Sanskrit texts into English. Manjunath Chandrashekhara - DGM of DivyaSree Developers, for giving support and encouragement to us throughout our journey in research. History channel team for encouraging us by accepting for programming on The History Channel (after the prototype is going to be done) a documentary on ancient advanced technology works by SWASTIK. Bijay Upadhyay, Research scholar, Karthik Amanchi – Founder of Aarshadhaatu Green nano technologies and Bala Sudhakar Sastry – Founder of Sri Maharshi research institute of Vedic technology, for giving encouragement to us. 3D srishti - research platform, for their support in coming up project to Research on composite material, RajaLoha 3D printing^[11].

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Presentation on Investments in Abkhazia

Mr. Edgar Gvazava



Investments in Abkhazia
Why is investing in Abkhazia advantageous?

- Situated on the Black Sea coast
- Total territory is 8,700 km²
- Length of the coastline is 214 km
- The capital is Sukhum
- The population – 243, 000 people
- The amount of sunny days in year – 220
- The average temperature in summer - +28, in winter - +5
- The average filling of the hotels is about 65% per year
- The average tourist flow is about 3,3 m people per year

Presentation on Investments in Abkhazia

Investments in Abkhazia
Brand «Abkhazia»

Abkhazian resorts, Abkhazian sanatoriums, Abkhazian fruits, Abkhazian honey, Abkhazian cheese, Abkhazian wine, Abkhazian adjika (a spicy sauce made of red chili paper), Lake Ritza, New Athos, Gagra, Pitsunda, Sukhum are just a part of Abkhazian brands that well-known in Russia and CIS countries. It was no surprise that Abkhazia was a favorite destination of the chairmen of the Central Committee of the USSR (Joseph Stalin, Nikita Khrushchev, Leonid Brezhnev, Yuri Andropov, Mikhail Gorbachev).



Investments in Abkhazia
Abkhazia is a museum of the world importance

- More than 1000 historical museums and temples are situated on the territory of the country
- There are over 58 caves in Abkhazia
- Krubera (Voronya) Cave is one of the world's deepest caves
- The cave of New Athos is the most famous in the country



Investments in Abkhazia Minerals of the Republic of Abkhazia

Abkhazia has a large amount of explored mineral resources, which can be used as the basis for the development of export-oriented industrial production.



No	Raw materials and a brief description	Estimated reserves in millions (tons/meters cub.)
1	Coking coal on the whole territory of Tkurchal district	17,8 tons
2	Barite – «Apshirinskoe» deposit	7,5 tons
3	Limestone – 10 areas all over republic	20 m/cu
4	Marbled limestone – 2 deposits	34,7 m/cu
5	Clay – 5 deposits	13 m/cu
6	Marl in Tkuarchal district	20 tons
7	Marble – 4 deposits	11 m/cu
8	Granite – 4 deposits	20 m/cu
9	Gabbro, gabbrodiabases – 4 deposits	12,5 m/cu
10	Dolomite – deposit in Tkuarchal	39 m/cu
11	Quartz sands	0,15 m/cu
12	Gravel for producing break-stone brand 800-1200	16,78 m/cu
13	Mineral hydropathics – Gagra, Aatsy, Bastal, Tkuarchal	unlimited
14	Mineral springs of drinking water – Auadkhara, Markhyaul, Narzan	unlimited
15	Eco-clean water from the drilling wells	unlimited

Presentation on Investments in Abkhazia

Investments in Abkhazia
Invest climate

- The law of the Republic of Abkhazia "On investment activity" includes tax incentives for investments, such as 0% property tax and 0% income tax, which are provided within the payback period but not more than eight years since the beginning of its implementation
- An Agreement between the Government of the Republic of Abkhazia and the Government of the Russian Federation "On trade of goods" includes duty-free trade regime between the Republic of Abkhazia and the Russian Federation.
- The law "On special economic zones" involves the creation of free economic zones on the territory of Abkhazia

Country	Value Added Tax %	Income tax %	Personal income tax %	Property tax %
Abkhazia	10	18	10	0,2
Russia	18	20	13	2,2

Utility rates

- The rate for electricity – 0,85 rub per kWh
- The rate for water – 34 rub for 1m³
- The rate for sewerage – 26 rub for 1m³

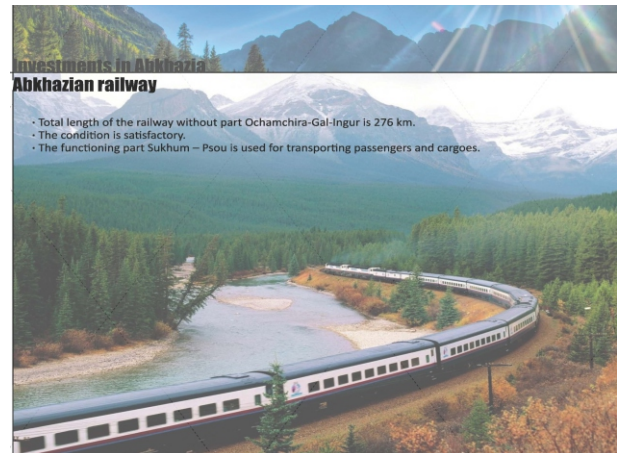
Investments in Abkhazia
Airport «Sukhum»

- International airport Sukhum named after V. G. Ardzinba is 18 km from Sukhum
- The runway is one of the longest in the CIS and is approximately 3,64 km that allows the airport to receive all types of civil and military aircrafts weighing up to 125 tons
- The 1st class airfield has one artificial air strip with the reinforced concrete surface.
- The airport is all-weather. Situated in the Colchis lowland on the Black Sea coast, that provides landing from 2 sides. This is more advantageous in comparison with Sochi airport
- Constructed for all types of the Soviet aircrafts. In the late 1960s here took off and landed the prototype of the largest passenger plane Tu-114
- In the end of 1970s the thickness of concrete surface of airfield was increased by 20 cm. That allowed accepting aircraft of IL-76 type. In the middle of 80s the runway was increased for the program "Buran" as reserve airfield.
- During the Soviet period, the terminal was able to accept up to 5 thousand passengers per day in the summer - "peak-time" for the Black Sea coast.

Investments in Abkhazia
Airport «Sukhum»

The airport reconstruction project will be conducted in two phases. The total cost of the project is **12, 950** million rubles in current prices for the 3rd quarter of 2015.

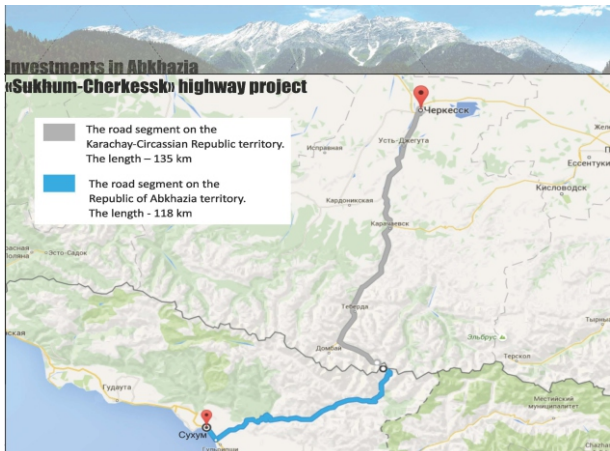
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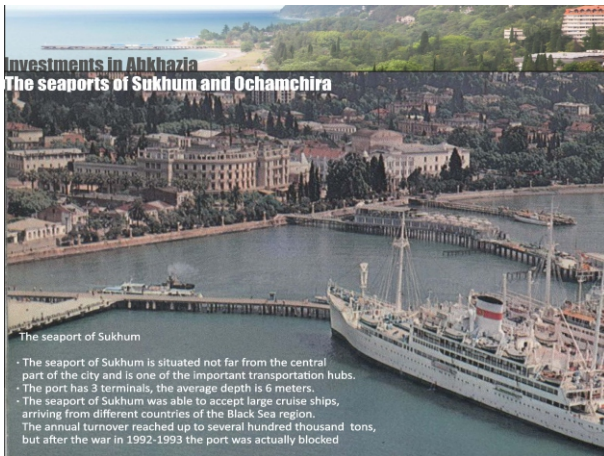
Investments in Abkhazia «Sukhum-Cherkessk» highway project

- The length of the road – 66 km
- The length of the reconstruction segment – 53 km
- A new segment to build – 13 km
- Reconstruction of the road gives an opportunity to shorten the distance from Cherkessk to Sukhum almost by half .
- The road runs in the areas where creation of the mountain-tourist complexes is possible.
- It gives the possibility of increasing tourist flow due to transport accessibility.
- The possibility to transport cargo flows by the shortest way to the ports and airport of Abkhazia.

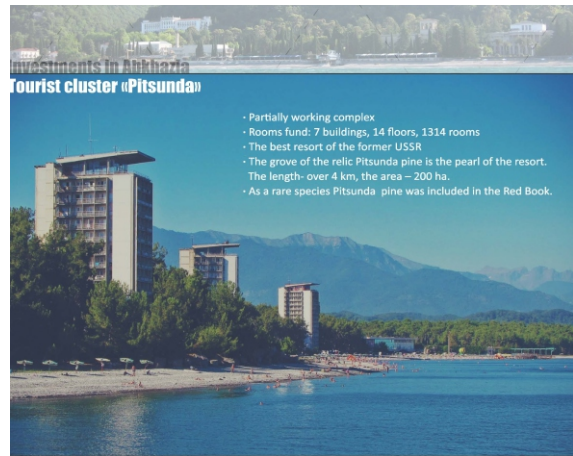
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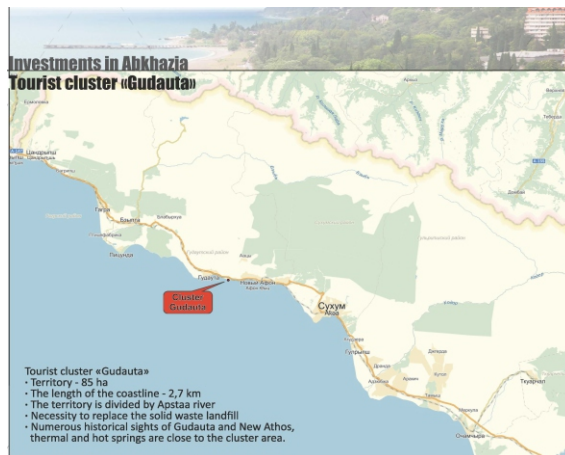
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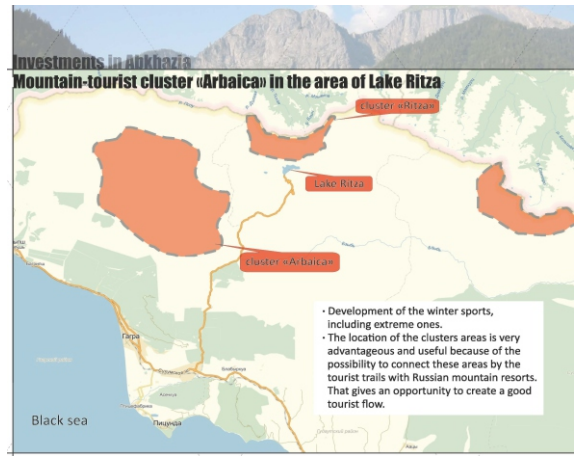
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**THE DEPICTION OF FEMALE EXPERIENCES IN SELECTED POST-2000
SOUTH AFRICAN NARRATIVES WRITTEN BY
WOMEN (JAMELA ROBERTSON'S NOT WOMAN ENOUGH,
FUTHI NTSHINGILA'S SHAMELESS AND KAGISO LESEGO MOLEPO'S
THIS BOOK BETRAYS MY BROTHER)**

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The paper examines the representation of women's experiences in three selected South African female authored novels, Not Woman Enough(2006) by Jamela E. Robertson, Shameless (2008)by FuthiNtshingila and This Book Betrays My Brother (2012), by KagisoLesegoMolope the study explored the way in which gender, and race and class discourses are treated relating to women's experiences in the selected texts. The three authors, born and bred at the peak of the anti-apartheid movement and women's protests against patriarchy, witnessed the effects of apartheid on both their families and societies at large which could perhaps have

influenced their writings. The study is informed by feminist theories, in particular womanist ideologies postulated by different theorists. The study of the three novels hence, interrogates issues of womanhood, the female voice, class and race in the post-apartheid era from a womanist perspective. Findings of the study show a shift in the representation of women and that the three writers are womanist writers in that their women characters, even though they go through terrible hardships are resilient, strong and determined to articulate their own concerns, rather than allow men to define them.

Key words:Apartheid, Feminism, Prostitution, Sexual violence, Womanism, Womanhood

ASSESSING THE IMPACTS OF RIPARIAN LAND USE ON GULLY DEVELOPMENT AND SEDIMENT LOAD: A CASE STUDY OF NZHELELE RIVER VALLEY, LIMPOPO PROVINCE, SOUTH AFRICA

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Human activities on land degradation have triggered several environmental problems especially in rural areas that are underdeveloped. The main aim of this study is to analyse the contribution of different land uses to gully development and sediment load on the Nzhelele River Valley in the Limpopo Province. Data was collected using different methods such as observation, field data techniques and experiments. Satellite digital images, topographic maps, aerial photographs and the sediment load static model also assisted in determining how land use affects gully development and sediment load. For data analysis, the researcher used the following methods: Analysis of Variance (ANOVA), descriptive statistics, Pearson correlation coefficient and statistical correlation methods. The results of the research illustrates that high land use activities create negative changes especially in areas that are highly fragile and vulnerable. Distinct impact on land use change was observed within settlement area (9.6 %) within a period of 5 years. High correlation

between soil organic matter and soil moisture ($R=0.96$) was observed. Furthermore a significant variation ($p \leq 0.6$) between the soil organic matter and soil moisture was also observed. A very significant variation ($p \leq 0.003$) was observed in bulk density and extreme significant variations ($p \leq 0.0001$) were observed in organic matter and soil particle size. The sand mining and agricultural activities has contributed significantly to the amount of sediment load in the Nzhelele River. A high significant amount of total suspended sediment (55.3 %) and bed load (53.8 %) was observed within the agricultural area. The connection which associates the development of gullies to various land use activities determines the amount of sediment load. These results are consistent with other previous research and suggest that land use activities is likely to exacerbate the development of gullies and sediment load in the Nzhelele River Valley.

Key words: Apartheid, Feminism, Prostitution, Sexual violence, Womanism, Womanhood

INVESTIGATING THE RELATIONSHIP BETWEEN STRATEGIC LEADERSHIP, CORPORATE ENTREPRENEURSHIP AND FIRM PERFORMANCE

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Nowadays the importance of corporate entrepreneurship as a vital element has been approved to increase firm's innovative capacity and their arrival to the stable competitive advantage. Researchers emphasize on the leadership role of firm's top management (strategic leadership) in formulating the organizational mechanisms of corporate entrepreneurship. Therefore, we can count on managers' leadership in strategic level as a factor for building and/or empowering corporate entrepreneurship. The purpose of this study is to present a model for the relationship between strategic leadership, corporate entrepreneurship and firm performance. The research statistical community was the Technology-driven Enterprises listed in Tehran Stock Exchange. Available sampling was used to determine the members of the sample. Its sample includes 42 cases in four industries of

automobile, electrical machines, chemical and medical products. Questionnaire was used as instruments for data collection. It has used Confirmatory Factor Analysis and Structural Equation Modeling in Partial Least Square (PLS) method for data analysis. SPSS and Smart PLS software were used to analyze and interpret the result, model validation and investigate the hypothesis. The analysis of the data resulted in formation of a model for the relation between strategic leadership, corporate entrepreneurship and firm performance. In this model, the strategic leadership affects both directly and through median variant of the middle-managers' entrepreneurial orientation, on corporate entrepreneurship. Moreover, both strategic leadership and corporate entrepreneurship variants affect the corporation performance directly.

Key words: Strategic leadership, corporate entrepreneurship, performance, innovation.

MANAGEMENT, BUSINESS SCALING: COMPARISON OF THE COUNTRY AND THE COMPANY MANAGEMENT

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To begin with, what are the qualities of a good manager. It is the ability to get a large amount of information from any source, even if it doesn't concern your work. For any manager, it is important to have some ability to speak on different topics, because the manager should be able to do large transactions, to know sociology and be able to negotiate (in addition to the ability to create concepts' development). What do you need to scale your business, if you have been working for many years, and you have the concept of development and other very important documents? For the first, you need to think why your business is not of a great success. Many great businesspersons created and improved their companies with the help of their curiosity. Steve Jobs before creating his own company, had been visiting the offices and plants of the company Intel, learning how to work, so as the Intel was one of the leaders in the computer equipment market. The case with Steve Jobs demonstrates that if you need to improve your business or solve some problems, do not hesitate to walk around the offices of your competitors. If they are more successful than you, then having visited their offices, you'll be able to scale and refine your own business. How to attract the attention of investors to your project? To begin with, what draws the attention of the

investor during your presentation. If you need to attract an investor, then you must convince him that you just have an idea and the completed plan for the development of your business and you need only a capital investment. If investors see that you have your plan, the concept of development, then the investors invest in your business. It is also important to convince them that you can be relied on. Even if you have everything, but you do not inspire investor confidence, you will be never invested.

As mentioned above, every manager needs to be comprehensively developed. For officials, ministers and even heads of the states it is very important. Management of Ministry or County district, as own business is very good method. It does not imply that this is the only way to gain and earn money. Government management as own business means that you require the results of your subordinates and try to improve their work.

Scaling your business, method of work and the ability to behave depend on you in the first place, and only you can make your choice. I hope that my work will help you to make your decision.

STRATEGIC TECHNOLOGY MANAGEMENT AS A CAUSALITY TO SOUTH AFRICAN COMPANY PERFORMANCE

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ABSTRACT

Cutting edge technology management goes beyond basic research and development (R&D). Increasingly, corporate strategists are making a more precise distinction between “technology” and “technology management.” The main purpose of this study was to develop an empirically derived classification system (taxonomy) for sustaining industry leadership, through the relationships that exist between technology and innovation strategy, technology management and company performance. A non-probability, judgment sample of companies listed on the Johannesburg Stock Exchange (JSE) were taken. Seminal

research studies were used to identify a set of technology strategy, technology management and innovation strategy dimensions. Four distinct technology factors obtained with the analysis, were proved to positively influence the company performance dimensions and were classified as Control Market Planning, Product Development Intensity, R&D Commitment and Technology Focus factors. As a result a conceptual model has been developed to demonstrate the integrated properties of this new proposed taxonomy of technology and innovation. The results show that strategic technology management choices can significantly affect company performance.

Key words: Company Performance; Product Development Intensity; Strategy Dimensions; Technology Focus; Technology Strategy.

12 WEEKS OF RECREATIONAL PHYSICAL INVESTIGATION OF THE EFFECTS ON THE ACTIVITY PROGRAM OF EDUCABLE CHILDREN

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To begin with, what are the qualities of a good manager. It is the ability to get a large amount of information from any source, even if it doesn't concern your work. For any manager, it is important to have some ability to speak on different topics, because the manager should be able to do large transactions, to know sociology and be able to negotiate (in addition to the ability to create concepts' development). What do you need to scale your business, if you have been working for many years, and you have the concept of development and other very important documents? For the first, you need to think why your business is not of a great success. Many great businesspersons created and improved their companies with the help of their curiosity. Steve Jobs before creating his own company, had been visiting the offices and plants of the company Intel, learning how to work, so as the Intel was one of the leaders in the computer equipment market. The case with Steve Jobs demonstrates that if you need to improve your business or solve some problems, do not hesitate to walk around the offices of your competitors. If they are more successful than you, then having visited their offices, you'll be able to scale and refine your own business. How to attract the attention of investors to your project? To begin with, what draws the attention of the

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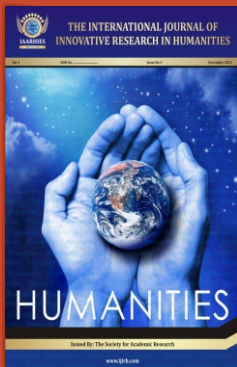
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