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Manpower Planning - Theoretical Perspectives of Utility Theory and Models

By Arindam Chatterjee & Dr. Sriparna Guha

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Manpower Planning - Theoretical Perspectives of Utility Theory and Models

Arindam Chatterjee [α] & Dr. Sriparna Guha [σ]

Abstract- Manpower Planning is an obvious and extremely critical function of some inter-related, explicit, operational, and functional Factors of an organization's overall people resource attributes, methodology and strategic initiatives. In India, the employment, competence functions, manpower planning and execution decisions, models and implications of them at the micro and macro environments of the organizations have still some role to play. Manpower planning models have been evolved to cater situational necessities of the workforce and at the same time leaves the scope of in-depth review and analysis of their limitations and corrective aspects. The reflections of utility analysis and allied assessment of cost-benefits also clarify the usage of alternative utility functions through systematic and logical approaches. The in-depth analysis and managerial perceptions on the analysis of outcomes have Significant roles in successful implementation of any manpower planning models in any given strategic corporate environment.

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I. Introduction

Workforce planning, by far, historically attributed in the realm of manpower statistics and research functions which reflects the importance of correct meaning of each grade under preferred recruitment and transition patterns. Industrial literature-based innovation witnesses in the last few decades an explicit and comprehensive attention as a potential area for incremental strategic application and provide feedback with an intention to build up appropriate Manpower Planning contexts, forecasts, analysis, models, decisions, outcomes, viability and related planned investment figures which are not to put the procedures on the balance sheet but to use the same for further decision making and revision purposes. Key questions in this context could be whether decisions successfully and effectively contribute to the key functional and operational organizational objectives? Whether we can justify the investments in different manpower development programs namely knowledge, training, staffing, enhanced employee benefits and employee involvements by their returns? As labor costs may, sometimes, exceeds half of total operating expenses (Milkovich & Boudreau, 1988), are the manpower assets being managed with the same accountability, prudence, rationality, importance and care as the machines, plants, financial, softwares and marketing resources? These questions produce a strong base of further research on the feasibility of different manpower models prepared in a different context and different stages of industrial development on varied manpower needs.

Author α: Ph.D Student, Department of Business Management, MAKAUT. e-mail: a.hrm.chatterjee@gmail.com

Author σ: Assistant Professor, School of Management Studies, Narula Institute of Technology.

II. Objectives of the Study

1) The study has been performed to explore the literature available in this field of Utility analysis and the phases of its evolution with increasing facets of methodology, and outcome in theoretical perspectives by various researchers and Institutions at different levels.
2) The study further plunge into the impacts of utility analysis and corresponding efforts as a strategic tool of the management in order to find out the worthiness of different manpower planning measures for various cadre of manpower along with its investment arenas, variables and sources of information, authenticity of inputs and Cost-benefit analysis in terms of quantifiable outcomes at large. The study also tried to extend its scope in measuring the acceptability and awareness amongst the stakeholders of varied management levels.
3) The study also, tried to signify the reasons for rejection of the processes and the outcomes of the efforts made in respect of Human Capital Management, if any, for further improvements.
4) In another part of the study, we discuss the principles of few renowned Manpower Planning and Human Resource Models for reviewing the merits, and demerits and its overall implications concerning specific linkage with each other.
5) The study also tried to focus on deriving a common and unified model through alleviating the shortcomings and complexity of the dynamics of stakeholder's functions, as far as possible, as a platform for different types of Industries to follow.
6) The scope further extends to merge the applicability of 'Utility Analysis' and 'HRM Models' to get a resultant of future-oriented, optimal and positive effort on Manpower management and development perspectives about validating the newly devised

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Model professionally by engaging the key stakeholders as a part of the model itself.

a) Utility Theory and Analysis

Utility Analysis of decision making is the main contributor to much strategic work force planning objectives. We generally justify manpower research and execution towards more knowledge, skills, re-defined employee benefits, training, PMS and promotion policies through their returns. Such labor costs may jump up to 50% of total operating costs of the company (Milkovich and Boudrean 1988), through, we do not manage the human resources with the same importance as the plant, machinery, and marketing resources. The manpower planning functions are regarded as a cost centre or as overhead items with little systemic attention devoted to the financial achievements contribution of workforce management and sustainability of corporate return on the same, is still a matter of debate in a widely read professional journal (Gow, 1985). Competitive IT and Management companies in India manage their workforce based on strategy–linked needs and different variables. In almost all the cases, HR Managers are required to justify the viability and extent of contribution as the workforce planning section is probably the steward for the said resource in both IT and Manufacturing Industries. The primary question could be asked from the top management to justify the outcome of a very costly executive development programme or to reduce 50% of the Manpower development programme as an important tool to reduce the overhead and some portions of recurring expenditure in quantitative terms. We may link the same for establishing the cost-benefit or designing a PMS logic software, process, investment of production for an execution of the same or against assignment of preparation of a competitive incentive and reward programme of low and high budget.

Utility analysis usually provides a new way of perception about manpower planning decisions, and it is considered by leading management scientists as a useful tool for corporate and strategic decisions regarding feasibility of implanting Manpower planning decisions and initiatives (Kendrick, 1984, Kopelman, 1986). The decision about other programme areas like finance, production, quality management, testing is not only based; on cost parameters, on the contrary, it's linkage with direct revenue generation process. Management scientists in B. K. Dynamics study (1973, 1975) proposes a decision support framework that explicitly considers the costs and benefits of human resource decisions. It has effects on the modus-operandi of workforce planning and functions in a more relevant, systematic and rational manner. More importantly, utility theory supports the decision making process even when the information is unavailable or uncertain or come out with usual choice or statistical analysis. Utility analysis could be difficult and detailed with interventions of sophisticated algebraic modules.

Apropos an idea on development of human capital through further investments, researchers have found the utility analysis very important and accordingly devised many calculations and method of deriving the utility of traditional HR functions such as productivity coefficients and human performance distribution for transcending them into monetary benefits in order to generate a quantitative output (Brogden 1949, Schmidt, Hunter, McKenzie & Muldrow, 1979, Cascio & Ramos, 1986, Raju, Burke & Normand,1990, Raju, Cabrera & Lezotte, 1996). However, even after considerable attempts, the techniques found negatively affect decision perceptions. Latham and Whyte (1994) also found that Utility analysis is lowering the support system for intervention as and when influenced by managerial decision. Macan & Highhouse, 1994, Hazer & Highhouse, 1997, propose that utility information are relevant, though, managers may not accept the outcome of utility analysis unless being fully aware of the workflow and phase-wise distribution of functional aspects. Proper acceptance of the results of survey from low to moderate levels, though have a better effect on decision acceptance (Carson, Becker & Henderson, 1998); still, a low acceptance level is more prevalent. After that, Rauschenberger & Schmidt, (1987), and Cronshaw, (1997) proposed to involve managers in the utility analysis process to enhance their understanding on the process and acceptance on the results.

The first utility analysis model of Brogden-Cronbach-Gleser (B-C-G) focuses only on one "cohort" of labors using the Brogden-Cronbach-Gleser (B-C-G) utility model (Brogden, 1946a, 1946b, 1949; Brogden & Taylor, 1950; Cronbach & Gleser, 1965). The quantity of productivity of entire person-years incorporates by a selection process is equal to the size of the hired group multiplied by their average tenure. Most researches on utility analysis by psychologists usually compare various Standard Deviation measures. Schmidt, et al., (1979) have measured the results by surveying supervisors reply of the job, enabling the psychologists to analyze and find out the value through estimation for a person better than 95%, 50% and 15% of the population. Whereas, Schmidt & Hunter, (1983) has estimated differently 40% of average salary or 20% of average productivity, among job incumbents. Though both Cascio & Ramos, (1986). Boudreau have adopted comprehensive and difficult methods on behavioral anchors and found different calculation methods to produce different SDy values, though failed to offer higher accuracy or validity. Long-term research is going on to explore new perspectives on how such models affect actual managerial decisions (Boudreau, Dyer & Rynes, 1986) along with an integrated program for further up gradation of the cost-benefit and utility

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analysis for improvisation of next generation decision management tools, using computers and statistical software. Workforce managers may thereafter analyze, and submit their strategic decisions using variables, cost-benefit and utility concepts; participate in more positive and constructive communication with supervisors, line managers and top management for future goal setting by enhancing the productivity, competitiveness and teamwork.

For using utility analysis, infrequently, as a managerial decision making aid, the study primarily identifies intractable factors on the evolution of Utility analysis. Secondly, managers must remain assured and convinced of using this tool to generate accurate outcomes. Hence, the issues related to reliability and validity needs further discussion. It is pertinent to examine information, either included or excluded, in various functions and methods of utility, like standard deviation, labor turnover ratio, human performance measures, etc. Lastly, considering the human performance as assets, researches and methodologies on decision-making are reviewed considering a relation to managerial judgment and acceptance on investment in capital development of HRM.

A study conducted on utility analysis with specific reference to selection procedures (e.g., Cascio, 1991, Cascio & Ramos, 1986, Cascio & Sibley, 1979, Cronshaw, 1986, Cronshaw and Alexander, 1985, Schmidt, Hunter, Mckenzie, & Muldrow, 1979), wherein the researchers have identified on identical cost/ benefit analysis to other workforce interventions, including appraisal feedback (Florin-Thuma & Boudreau, 1987, Landy, Farr, & Jacobs, 1982) recruitment (Boudreau & Rhynes, 1985) and turnover/attrition/layoff management (Boudreau & Berger, 1985, Cascio 1991). Such other studies with a large degree of precision to identify the financial return on investments designed to enhance employee productivity. However, few companies additionally use utility analysis in strategic decision making on the implementation of new HR Policies.

Utility theory is a fundamental aspect of decision making and cost-benefit analysis which is useful in determining the prospective areas of the same in organizational context. “a fundamental axiom is are formulated in a slightly different manner (Von Neumann and Morgenstern, 1947).” The theory is based on the likelihood of consequences of possible alternatives and decision makers’ preference towards the same as well. It systematically considers all the relevant and available information for preference of the decision makers. Keeney, (1980) advocated for the utility theory and analysis as it helps the decision makers to evaluate alternatives through formulating and integrating judgment and preferences. Decision makers may, categorically exploit the knowledge, experience, judgmental skills for professional and individual decision making. Studies on the effects of participation on acceptance of strategic decisions, performance management systems and organizational development efforts (Roth, Segars & Wright, 1998) also examine what the objectives of the organization are and how managers try to achieve strategic objectives (Wright & McMahan, 1992). In modern days, Kaplan and Norton's Balanced Scorecard (1992, 1996a, 1996b), also decomposes an organization's strategic intent into four main components, however, they specified only one of them in financial terms. Dyer, 1984; Schuler & Jackson, 1987a proposes to successfully pursue a particular strategy along with a specific set of manpower practices in line with strategy and overall HRM practices for incorporating a synergistic effect on firming the performance (Schuler & Jackson, 1987b; Gomez-Mejia & Balkin, 1992; Delery & Doty, 1996). It is found that the company's business strategy must determine and become responsible for building the required capabilities (Yeung & Berman, 1997).

The analysis has been done on the shortcomings while defining the main barriers in identification and assessment of the utility function, through it is really cumbersome to formulate the point of representation of Utility functions.

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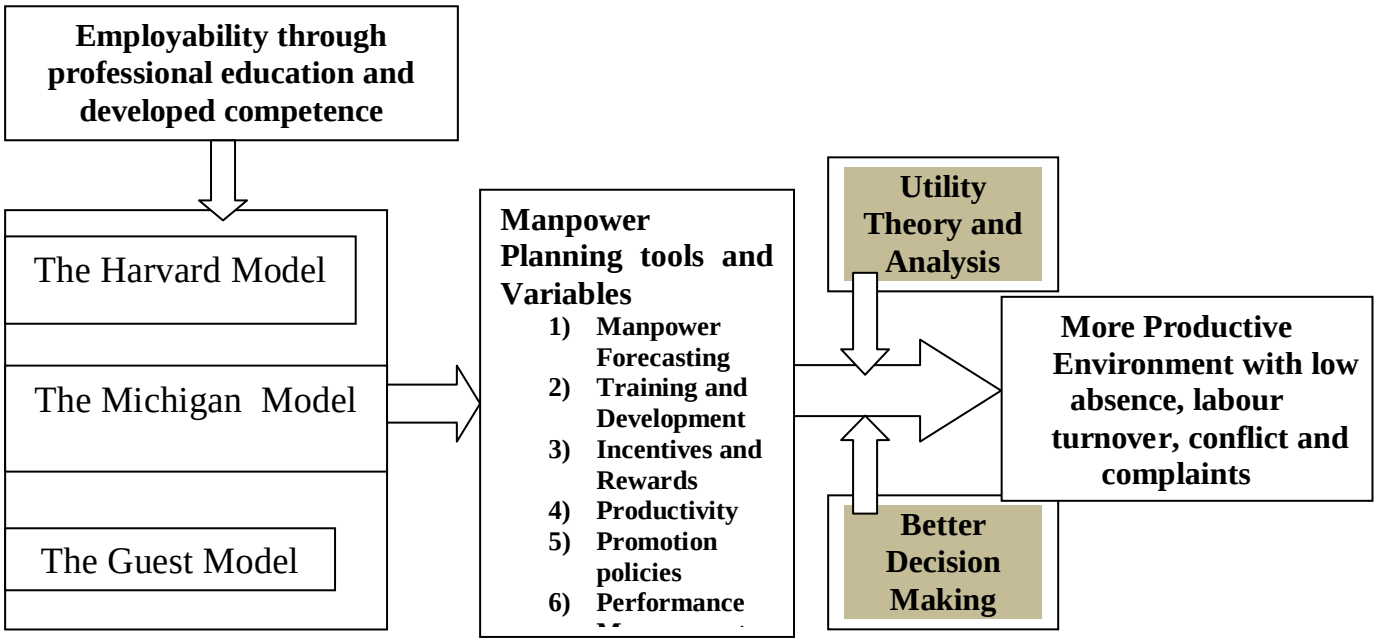

Figure 1.1: A Utility- HRM model-aligned productivity enhancement diagram

For evaluating the optimum benefit of utility based models, many studies used the generic, and available cost-benefit ratio in further investigations. The prime aspects in most of such analysis are the primary, secondary and tertiary assumptions, as the case may be. Additionally, to make the utility function based on aforesaid parameters, practical and meaningful, the utilization of the ratio based on costs to benefits shall also require more and substantial assumptions for the calculations. Fishburn (1965, 1970) and Keeney and Raiffa (1976) discussed an analytical representation using all costs and benefits and other measures using a utility function with specific arguments on costs and benefits incurred or supposed to be incurred against the contexts which are an assumption based, though not hypothetical in a real sense. The protocol of the analysis reflected on the measurement of quantitative utility, based on theoretical apprehensions, and a significant effort has been made to establish the same mathematically.

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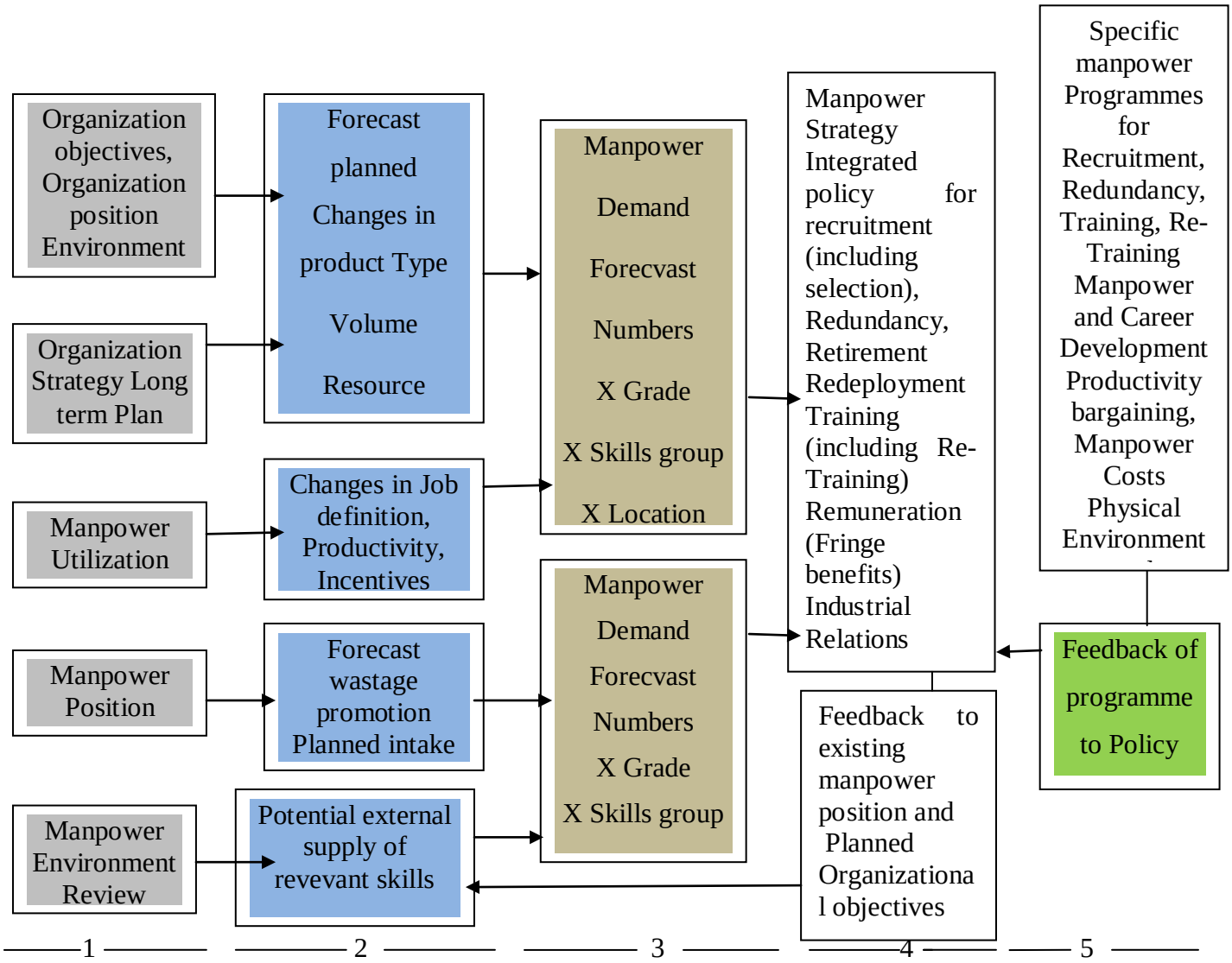

Figure 1.2: Components of Manpower and Personnel Planning

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III. Manpower Planning Models

a) Harvard Model

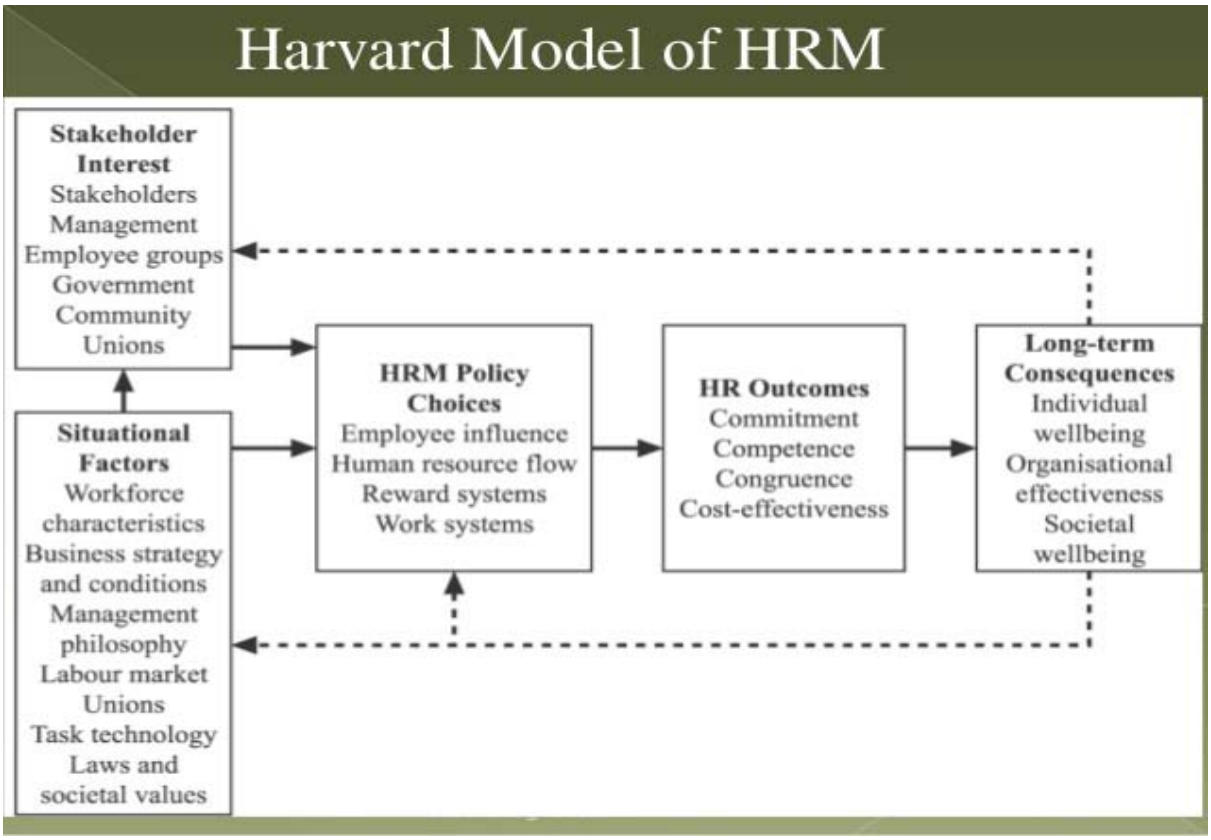

Figure 2.1: The Harvard Model

It was postulated by Beer et al. (1984) at the School of Management, Harvard University. While formulating the model, to reflect on comprehensive solutions, the authors of the said model also coined it the micro and macro level model of HRM territory. This model acknowledges the involvement of community at large along with one/multiple stakeholders which include but not limited to a different group of employees and Government. We also discussed that the recognition of the legitimacy of aforesaid the existence of various stakeholders perceived about the model in a new way, and the same evolved as a neo-pluralist model and the same was emphasized specifically on human aspects along with soft sides of workforce planning.

Grinold and Marshall (1977) in the research work titled "Manpower Planning Models" Harvard model asserts to compete for as much as it entreats to include six crucial elements of Manpower planning like stakeholders, conditional parameters, manpower planning strategy options, HR results, permanent outcomes, and a review loop. The results go directly into the company and to the people who have a particular interest.

We have recorded above factors as the workforce strategy which shows staff-level influences; resource flows, reward system, etc. A utility-based analysis of the model depicts that the results and layout are deeply rooted in the people relations as an HRM tradition. We recognize the anticipatory influence of employees with a channel of human relations, engagement, and motivation alongside the development of a corporate culture under internal bonding, trust, and teamwork. The takeaway of the critical process outcomes renders a visible impact on a long term to very long term consequences, improved productivity outcome, organizational output, and effectiveness which will, in turn, explore and influence shareholder interests and relevant interim factors to make it a cycle. In light of utility analysis, the quantitative outcomes from such processes are soft as the process confers high congruence, exceptional commitment, engagement, competencies, etc. Harvard model's philosophy stands on the belief of receiving competitive advantage through quality human resources by treating them as assets and not costs.

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b) The Michigan/Matching Model

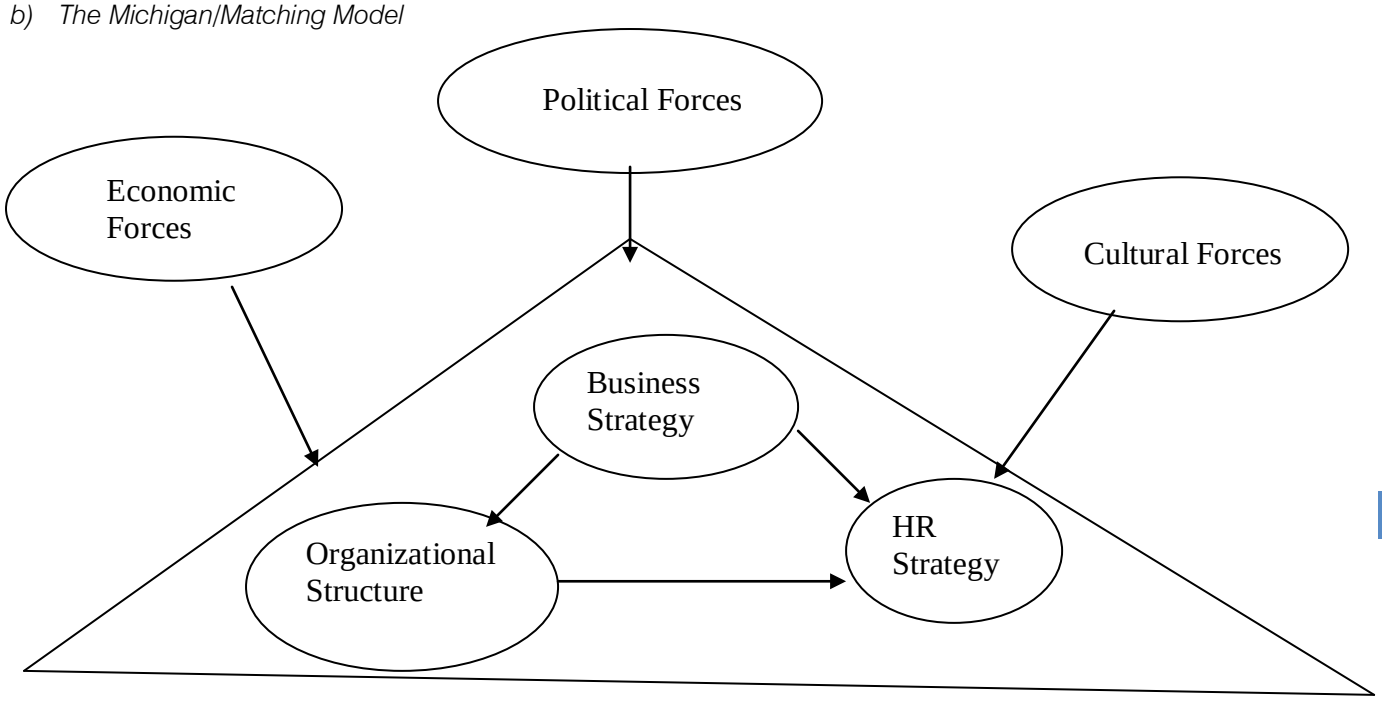

Figure 2.2: The Michigan Model: Devanna (1984)

The Michigan model was developed by Fombrun, Tichy, and Devanna (1984) during their comprehensive research on Human Resource Models at the Michigan Business School. They also named this model a matching model of HRM. This model has been propounded as 'hard' aspects of Manpower planning and HRM because it emphasizes on considering employees as a blueprint of the organization's business strategy. The Hard aspects of HRM focus on the usage of people as resources and as a factor on the competitive success of the organization. The Business and strategic HR areas should invariably be highly systemic and analytical as the objectives are an integral part of the business strategy, and, hence, becomes crux of this model (Evans and Lorange, 1989). The Michigan model acknowledges the primary area of importance for upgrading, motivating and awarding people, and emphasizes mostly on managing the human assets and optimally utilize them to achieve desired goals. Although empirical evidence have not generated any strong linkage of practicing consistent and systematic with hard HRM, still the studies by Truss et al., (1997) at large organizations where the employees were associated and managed towards business goals.

c) The Guest Model

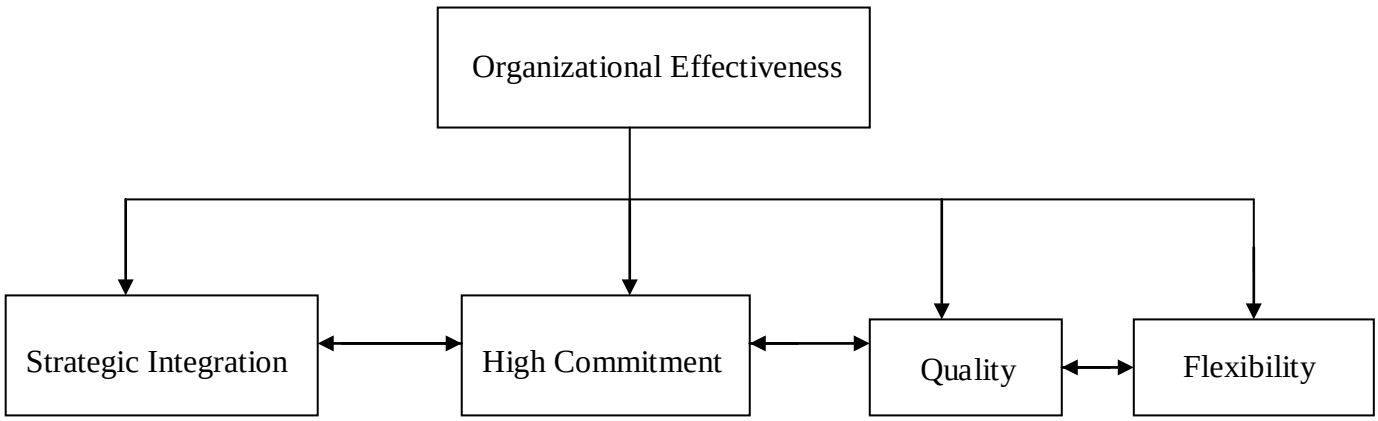

Figure 2.3: The Guest Model

David Guest propounded in 1987 which is a fusion of soft and hard aspects of Manpower planning and a combination of the following four functions:

- Strategic Integration
- Flexibility

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- High Commitment
- Quality

In the Strategic integration aspect, the model tells about the integration of Manpower and other crucial HR strategies with overall business strategy, both in short and long run, to achieve desired goals and thus focuses on harder aspects of the HRM planning. This model also fosters Manpower planning as an effective part of the functional plans and shall have the potential to ensure the implementation of other related strategies in organizational context. Whereas, flexibility is purely concerned with the adaptability of the Policies, Management, employees and the entire organization to the changing business and works environment with inclusions of new cultures, challenges, and innovation. Flexibility can bear hard and soft aspects of HRM and shall be in numeric, functional, etc. The utility of labor requirements are the harder aspect of the Manpower planning where the inclusion of labor in a system is fully need-based and may often relate to exploitation. Flexibility, at times, concerned to achieve business objectives, though by treating employees or labors, as fairly as possible. High commitment denoted the cohesion of employee's individual or collective outcomes with the objectives of the organization as a whole where a positive behavior and attitude helps the employees to explore their potential to the fullest and stretch them wholeheartedly to achieve the organization's commitments. Lastly, this model believes in overall quality enhancement by preparing and delivering quality goods and services resulting in quality treatment to its manpower assets.

The Harvard model creates a basis for a critical analysis of comparative manpower planning and other HR aspects as it categorically classifies the inputs and outputs at the organizational and societal level. It also broadly recognizes the interest of stakeholders and the trade-offs between management and the labors/employees and widens the scope of influencers in strategic choices of management, the motivation of employees and situational issues of other stakeholders. Whereas, the Michigan model explicitly narrated the coherence of strategic guidelines internal to the environment and expresses it's further coherence to the business strategy which is purely external to the environment. The Guest model, however, clearly focuses and chart out the inter-linkage, and maps of inputs and outputs of various Manpower and HRM functions with a thorough association with strategy, practice, impact, overview and outcome. It shows how the coherence of relevant HRM practices has higher impacts if applied properly and how it results in better individual performance in a given environment. The factors include commitment, quality, flexibility, productivity, innovation, conflict, turnover, etc. However, the guest model has not taken different inputs for situational constraints and stakeholders inclusion which may significantly change the outcome of financial, behavioural and performance areas, as the case may be. It should also take the dynamism of the environment and alternate functions into consideration for better justification. The Michigan model failed in its prescriptive nature, more or less, and focus on it's driving forces along with four definite practices like selection, performance, appraisal, and reward. Unlike the Harvard model, it is failed to understand the situational factors of different stakeholder's interest and thus the basis of strategic choices by various levels of decision alternatives from Management. It also pays less attention towards cost-benefit viability of the prescribed processes to be more realistic. The main weakness of the Harvard model was the absence of the basis for practical and theoretical measurement of coherence and relationships between situational inputs, effects, and outcomes at situational and individual levels, performance, and it's indicators. In this context, we propose a new model in Indian context for Manpower planning and development where we take from individual and societal context by incorporating two-way utility analysis process, internal and external to the environment.

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d) A New Model on Manpower Planning and Development

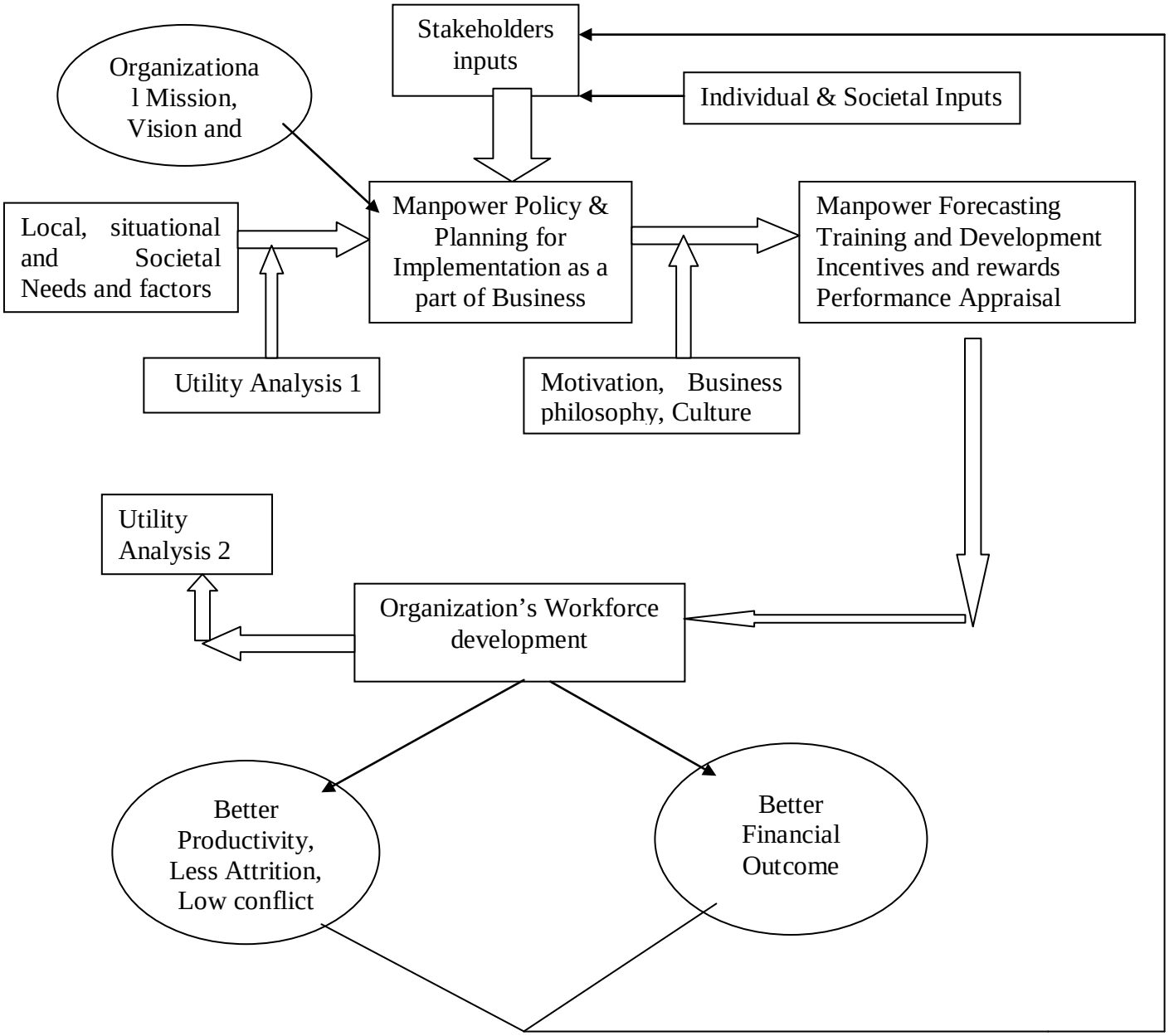

Figure 3.1: Newly Proposed Model of Manpower Planning and Development

IV. Conclusion

We consider systematic and cost-effective manpower and personnel planning as a crucial aspect in an organizational context and it is a significant problem in any large organization because of its poor understanding of real outcomes along with the lack of involvement of decision makers in the whole process. We can take lower acceptability and awareness on analytical perspectives of utility in the presence of various manpower planning models in a fast changing and dynamic environment as the other reasons. The consequences of the alternative policies selected are also significant. Most traditional manpower and personnel planning models have not carefully focused on those goals and outcomes are conceptual models at the best. The utilization of utility theory and analysis for structuring objectives and quantifying an objective function has much to offer for any need-based, situation-driven, non-prescriptive outcomes. However, for the potential advantages to be achieved, the research must be carefully and thoroughly conducted. The cost-benefit outcomes is sound and practical. The operational procedures of the analysis are available for delineating viability of a model, or it's inputted through systemic and normative concepts. However, it is getting

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increasingly difficult to utilize the resources, and its application requires substantial creativity to generate the desired outcome which is due to the complexity of the stakeholder's problem statements, subject to shortcomings of the approach. Irrespective of the changing environment in the organizational context, if the variables remain predictive and responsive the input category, the output would be more accepted by the beneficiaries and thus will generate more involvement in the decision making and utility analysis process in India.

References Références Referencias

1. American Management Association (1986), Hiring strategies and costs: The AHA report. New York: American Management Association.
2. Anderson, J. C., Milkovich, G. T. & Tsui, A. (1981). A model of intraorganizational mobility. Academy of Management Review, £, 529-538.
3. Arrow, K.J. (1951) (2nd ed. 1963). Social Choice and Individual Values.Wiley, New York.
4. Beer, M., Spector B., Lawrence, P. R., Mills, D. Q., & Walton, R. E. (1984). Managing Human Assets. New York: The Free Press. 209 p.
5. Bell, D.E. (1979). Consistent assessment procedures using conditional utility functions. Operations Research, 27, 1054-1066
6. Bell, D.E. and H. Raiffa. (1979). Marginal value and intrinsic risk aversion. HBS 79-65, Graduate School of Business Administration, Harvard University, Boston,
7. Bierman, H. Jr., Bonnini, C. P., & Hausman, w. H. (1981). Quantitative analysis for business decisions. Homewood, lll: Irwin.
8. Boudreau, J. W. (1983a). Economic considerations in estimating the utility of human resource productivity improvement programs. Personnel Psychology, 36, 551-557.
9. Boudreau, J. W., Dyer, L. D. & Rynes, S. L. (1986). Development of utility analysis models for manpower and personnel decision making, and investigation of their effects on decision processes and outcomes. u.s. Army Research Institute, Contract SFRC #MDA903-87-K-OOOl.
10. Boudreau, J. W. & Milkovich, G. T. (1988). Human resource decisions: Personal computer (PC) exercises in personnel/human resource management. Plano, TX: Business Publications, Inc.
11. Brown, R.V., A.S. Kahr, and C.R. Peterson. (1974). Decision Analysis for the Manager. Holt, Rinehart and Winston, New York.
12. Campbell, V.N., M.F. O'Connor, and C.R. Peterson. (1976). Accrued utility of navy enlisted personnel. Decisions and Designs, Inc., McLean, Virginia.
13. Cronbach, L. J. & Gieser, G. C. (1965). Psychological tests and personnel decisions (2nd ed.). Urbana, IL: University of Illinois Press.
14. Cronshaw, S. F. & Alexander, R. A. (1985). One answer to the demand for accountability: Selection utility as an investment decision.
15. Dyer, J.S. and R.K. Sarin. (1979). Measurable multi attribute value functions. Operations Research, 27, 810-822.
16. Farquhar, P.H. (1977). A survey of multi attribute utility theory and applications. In Multiple Criteria Decision Making, M.K. Starr and M. Zelany (eds.), North Holland, Amsterdam.
17. Fishburn, P.C. (1964). Decision and Value Theory. Wiley, New York.
18. Fishburn, P.C. (1965). Independence in utility theory with whole product sets. Operations Research, 13, 28-45.
19. Fishburn, P.C. (1970). Utility Theory for Decision Making. Wiley, New York.
20. Fishburn, P.C. (1973). The Theory of Social Choice. Princeton University Press, Princeton, NJ.
21. Fishburn, P.C. (1977). Multiattribute utilities in expected utility theory. In Conflicting Objectives in Decisions, D.E. Bell, R.L
22. Hunter, J. E. & Schmidt, F. L. (1982). Fitting people to jobs: The impact of personnel selection on national productivity. In M. D. Dunnette & E. A. Fleishman (Eds.), Human performance and productivity (Vol.1, pp. 233-284).
23. Jaquette, D.L., G.R. Nelson, and R.J. Smith. (1977). An analytical review of personnel models in the Department of Defense. R-1920-ARPA. The Rand Corporation, Santa Monica, CA.
24. Keeney L.R(1980), Manpower Planning and Personnel Models based on Utility Theory, DTI Electric, San Francisco.
25. Keeney, and H. Raiffa (eds.), Wiley, Chichester, England. Harsanyi, J.C. (1955). Cardinal welfare, individualistic ethics, and interpersonal comparisons of utility. Journal of Political Economy, 63, 309-321.41
26. Mass.B-K Dynamics, Inc. (1973). Development of utility measures for manpower planning. TR-3-177, Rockville, Maryland.
27. Schmidt, F. L. & Hunter, J. E. (1983). Individual differences in productivity: An empirical test of estimates derived from studies of selection procedure utility. Journal of Applied Psychology, 68,407-414.
28. Schmidt, F. L., Hunter, J. E., Pearlman, K. & Hirsh, H. R. (1985). Forty questions about validity generalization and meta-analysis. Personnel Psychology, 38, 697-798.
29. Schmidt, F. L., Hunter, J. E., McKenzie, R. C., & Muldrow, T. W. (1979).Impact of valid selection procedures on work-force productivity. Journal of Applied Psychology, 64, 609-626.

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