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Article

Information Asymmetry: A Constrain in Building Knowledge Management System in Small Enterprises

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Abstract

The success of a firm depends on how its knowledge is used to build own competencies and its first stage is to build own internal knowledge management system considering that the firm is a source of intelligence and knowledge. In small firms, the development of knowledge management is at its infancy or a slow process. Information asymmetry is the main reason for this, and this paper analyse sources of information asymmetry and the factors influence the development of Knowledge Management System in small firms. The respondents are micro and small firms in Bengaluru engaged in five sectors, apparel, engineering, food, machine components and OEMs. The responses were taken from managers and owners to analyse the difference in self-management and agency management. The existence of knowledge management is taken dependent variable and nine dependent variables based on investment, internal communication, documentation, and internal communication flow are used in analysis. The influence of control of business, i.e., Self-management or agency management is identified as high. Investment, documentation, internal communication are the independent variables that have high influence on implementation of Knowledge Management System.

Keywords: *Information asymmetry, knowledge management, documentation, internal communication*

JEL Code: C83, D04, D22, D23, D82, E 23

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Introduction

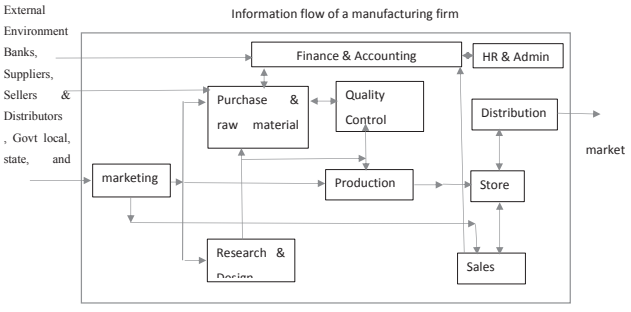
Information Asymmetry

Information asymmetry is one of the shortcomings faced by small-scale firms. There are two questions arise here,

1. How does information asymmetry arise?
2. How does it affect the organisation?

Information asymmetry is a phenomenon that arises from three defects of information flow: documentation inefficacy, system ineffectiveness and intellectual constraints (Dutt & Kusumawati, 2019). Infection in information flow arises from three sources: unclear drawings, diagrams, lack of adequate information or explanation, and non-standard notations. This is the basic source of information asymmetry in which the information is unknown, unknowingly veiled, or purposefully hidden. The information management system sets rules to document, store and retrieve information. The onus to implement a system is vested in the firm's owner, which needs investment in technology and expertise. It reduces the competitive advantage of firms.

Figure 1. Block diagram of information flow identified in a small-scale manufacturing firm



An intellectual constraint is when information cannot be understood or explained due to a lack of clarity or experience in explaining the information. Information asymmetry is when the information is confined to one source and not distributed or shared with others who need it or to whom it may be useful. It may be intentionally (controlled) or unintentionally (neither recorded nor stored). The real-time documentation will record more information. Information asymmetry is a source of recurring and non-contributing activities that cause delays at different points. The redundancy in innovative and creative improvements in the process leads to an extension of operating cycles.

The organisational system has five subsystems: environment, psycho-social, objectives, structure, and technology. The environment stands for the internal and external environment, and the resources and information flow across the boundary bilaterally. Identification of Information asymmetry in small-scale manufacturing industries (based on primary data).

Scope of research

Information asymmetry is a hidden challenge in any organisation, as management, employees, and the system are responsible for it. The MSME's contribution to the Indian GDP is approximately 30%, and the same to exports is approximately 40%. It employs 110 million people nationally. It is highly diversified in the service and manufacturing sectors (Visal, 2020). The information asymmetry is one of the bottlenecks in accessing formal finance. The pandemic season has changed the operation strategy of all firms, compelling a transition from traditional business management to a system-based platform. Hence, this research focuses on sources of information asymmetry in micro and small-scale firms in Bengaluru city, spread over different industrial estates.

Review of literature

The organisational system has five subsystems: environment, psycho-social, objectives, structure, and technology. The environment stands for both the internal and external environment, and the resources and information flow across the firm's boundary from market/ regulatory bodies to the organisation and vice versa. Structure and technology are the paths of communication. The psycho-social factors are psychological aspects of an individual and individuals in the group. The information flows in a team, from individual to individual as well as individual to team and when it is stored for future use and retrieved when it is helpful for future use [9]. The evolution of Information and Computational Technologies has developed a common platform for receiving,

storing, and accessing organisational knowledge by authorised employees to ensure confidentiality and purpose of use.

The Lotus Notes (later christened IBM Notes) was created as a platform for internal data coordination, storage, retrieval, and management of access to information. It has helped to develop and manage knowledge management systems (Prusak & Weiss, Knowledge in Organisational settings, 2007). The knowledge Management system helps track resource flow, work completion, track of previous work done, designs and alterations, and consolidating the competencies of the firm to meet future needs (Clydesdale, Entrepreneurial Opportunity: The Right Place at the Right Time. New York (Routledge, 2010)

The factors that influence the development of a Knowledge Management system include the attitude and characteristics of management (entrepreneur) (Qorraj G., 2017), investment in technology (Computerization and Digitalization), capabilities of employees to adapt to the system and to adopt changes in the system, training given to the employees and the characteristics of the firm (Fuller-Love, 2006).

Objectives

- To identify sources of information asymmetry in micro and small-scale industries
- To analyse the solutions taken by the firms
- To analyse the factors that influence the implementation of a Knowledge Management system in micro and small firms

Research Methodology

The data from this research is collected from 302 companies engaged in four domains of operations: engineering, apparel, food, machine component manufacturing, and original equipment manufacturing in the Bengaluru Industrial Estate. These firms are partially automated and partially labour-oriented.

This research has two stages: data collection through interviews with managers and owners to understand the sources of information asymmetry and the factors that influence the maintenance of a KM system in a firm. A dichotomous questionnaire is used to get the responses from the respondents to understand the probability of the influence of each factor on the implementation of a KM system. This analysis helps group the companies based on the KM system strategies for focused research to find more clarity in data and response.

The respondents of this research are proprietors and managers. The information is collected from proprietors and managers of the companies selected for the survey. In a few companies, more than one manager had responded. Production managers of all companies responded to the survey. Convenient sampling is used in this research as only those respondents who have shown readiness to share information are selected for qualitative and quantitative data collection. The response rate is 52%.

Analysis and Interpretation

The data was collected using two questionnaires to understand the response towards the information asymmetry and development of knowledge management. The interview method is used to collect qualitative information, and a questionnaire is used to understand a preliminary level analysis, the existence of independent variables in the firms, and the level these existences spread over among firms.

Binomial logistic regression is used for the data analysis as the dependent and independent variables are dichotomies to check whether the environment for healthy knowledge management exists. The dependent variable is the 'existence of a full-fledged knowledge management system'. In contrast, the independent variables are an investment in the KM system, information management system, information flow, training for employees, product standardisation, employee involvement, deviation in target achievement, the specification used in the process, documentation model, process consistency, market competition, internal communication, product promotion intensity and profitability. The three control variables used are sector, respondent, and ownership. The five sectors selected here are apparel, engineering, food, machine components and original equipment manufacturers. The two types of respondents are owners and managers. The ownerships include proprietorship, partnership, and family-run.

Binomial Logistic Regression models

The binomial logistics regression model analyses how the independent variable influences the dependent variable, the percentage of variance explained (Cox & Snell R square) or Nagelkarke R square. The probability shows the major distribution, and the -2 loglikelyhood gives the variation from the fitted model—the Wald Chi-square and the -2LLi show the model fitness. The probability shows the null effect or actual effect on the dependent variable.

Table 1: Binomial Logistic Regression models for Apparel

Model	-2log likelihood	Cox & Snell R square	Nagelkerke R square	Variable equation	Variable	Wald	Odds to probabilities
Investment	61.105	.350	.467	In(odds) = -1.792+3.045x	x=0 insufficient x=1 sufficient	11.007(p=.000) 20.490, (p=.000)	P (0) =.142 P (1) =.777
Information	44.784	.497	.662	In(odds) = 3.219-4.707x	x=0 informal x=1 formal	30.152(p=.000) 24.75, (p=.000)	P (0) =.961 P (1) =.226
Training	69.498	.259	.346	In(odds) =-.802+ 2.648x	x=0: basic introduction x= 1 systematic	5.779 (p=.000) 14.1 (p=.000)	P (0) = .31 P (1) =.864
Product standardisation	74.329	.201	.269	In(odds) =-1.504 +2.197x	x=0: nonstandard x= 1 standard	11.32 (p=.000) 22.78 (p=.000)	P (0) = .182 P (1) = .66
Employee involvement	54.535	.414	.552	In(odds) =-1.421 +3.542x	x=0: passive x= 1: active	11.392(p=.000) 22.78(p=.000)	P (0) = .19 P (1) = .892
Specification	77.202	.165	.220	In(odds) =-.693 +1.846x	x=0: Customer specified x= 1: Company specified	4.16 (p=.000) 10.18(p=.000)	P (0) = .33 P (1) = .76
Documentation	73.165	.216	.288	In(odds) =-.811 +2.197x	x=0: Informal x= 1: Formal	5.463 (p=.000) 13.03(p=.000)	P (0) = .35 P (1) = .79
Process	74.329	.201	.269	In(odds) =-1.504 +2.197x	x=0: Consistent x= 1: inconsistent	7.404 (p=.000) 11.698(p=.000)	P (0) =.18 P (1) =.66
Market Response	67.890	.278	.370	In(odds) =-2.773 +3.434x	x=0: non competitive x= 1: competitive	7.23 (p=.000) 10.18(p=.000)	P (0) =.058 P (1) =.66

The analysis shows that the existence of a Knowledge Management system in the apparel industry is influenced by investment (.777), training for employees (.864), and employee involvement (.892), which have more effect as their probability is high. The probabilities of standard products (p=.66), company-specified standards

(.76), and market competitiveness (p=.66) show that the apparel industry maintains an effective KM system. The inconsistency in process and informal internal communication are two challenges. The informal internal communication system is faster due to less documentation and accessible communication. However, there needs to be more traceability, and there is a possibility for a decrease in the correctness of information. The inconsistency is reflected due to the modulation in frequency in the quantity of products. It depends on demand, promotion, and distribution. The effect of other independent variables, which are statistically insignificant and does not contribute to the variation in the dependent variable.

Table2: Binomial Logistic Regression models for Engineering firms

Model	-2log likelihood	Cox & Snell R square	Nagelkerke R square	Variable equation	Variable	Wald	Odds to probabilities
Information	34.041	.518	.741	In(odds) = 1.846-5.044x	x=0 informal x=1 formal	8.827(p=.000) 28.01, (p=.000)	P (0) =.861 P (1) =.039
Training	41.304	.470	.672	In(odds) =-2.526+ 4.666x	x=0: basic introduction x= 1 systematic	23.62 (p=.000) 26.62 (p=.000)	P (0) = .074 P (1) =.894
Product standardisation	23.25	.586	.838	In(odds) =-3.912 +6.215x	x=0: nonstandard x= 1 standard	15.04 (p=.000) 24.6 (p=.000)	P (0) = .019 P (1) = .91
Employee involvement	81.48	.414	.552	In(odds) =-1.421 +3.542x	x=0: passive x= 1: active	11.392(p=.000) 22.78(p=.000)	P (0) = .19 P (1) = .892
Specification	77.202	.081	.118	In(odds) =-2.251 +1.7x	x=0: Customer specified x= 1: Company specified	9.171 (p=.000) 4.543(p=.000)	P (0) = .104 P (1) = .365
Documentation	59.92	.101	.145	In(odds) =-2.058 +3.157x	x=0: Informal x= 1: Formal	21.294 (p=.000) 23.53(p=.000)	P (0) = .11 P (1) = .53
Internal Communication	69.25	.22	.31	In(odds) =-2.273 +2.721x	x=0: inconsistent x= 1: consistent	7.404 (p=.000) 11.698(p=.000)	P (0) =.093 P (1) =.624
Market Response	67.890	.278	.370	In(odds) =-2.773 +3.434x	x=0: non competitive x= 1: competitive	7.23 (p=.000) 10.18(p=.000)	P (0) =.058 P (1) =.66

The internal information system is informal and the -2loglikelyhood is small compared to that of other variables. The informal communication is easy to exchange, quick, and easy to understand. In engineering industry, generally sketches will be drawn or printed professionally. Specification and documentation have a lower probability for 1 (positive response). Employee involvement and training have a high influence in Engineering industry while, specification, documentation, and market competition have a lower effect. The production process in an engineering company will be either a job works or a batch production in which the company design a product for customer and after the approval from the customer, it may be produced as a unique output or in batch production. Hence, there is a probability for using a design continuously and hence,

the probability for company specification is less. Information, training, and product standardisation has a low -2loglikelihood and Nagelkerke R square and it shows a wide variation among respondents.

Table 3: Binomial Logistic Regression models for food industries

Model	-2log likelihood	Cox & Snell R square	Nagelkerke R square	Variable equation	Variable	Wald	Odds to probabilities
Investment	29.485	.567	.777	In(odds) = -3+ 5.298x	x=0 insufficient x=1 sufficient	17.064 (p=.000) 26.114 (p=.000)	P (0) =0.047 P (1) =0.91
Information	29.845	.560	.773	In(odds) =-2.615 +5.559x	x=0 informal x=1 formal	19.115(p=.000) 21.914(p=.000)	P (0) =.068 P (1) =.95
Training	34.970	.523	.723	In(odds) =-2.590 +4.582x	x=0: basic introduction x= 1 systematic	18.72 (p=.000) 25.73 (p=.000)	P (0) = .07 P (1) =.88
Employee involvement	76.437	.09	.122	In(odds) =-1.070 +1.427x	x=0: passive x= 1: active	11.392(p=.000) 22.78(p=.000)	P (0) = .15 P (1) = .58
Deviation	72.68	.140	.194	In(odds) =-1.253 +1.792x	x=0: low x= 1: high	12.207(p=.000) 9.09(p=.000)	P (0) = .22 P (1) = .62

In the food industry, only five components are sensitive to the KM system. They all have a high probability for variables except employee involvement. Only a few variables contribute to the variation in the existence of the Knowledge Management system. It shows that the -2loglikelihood is small, and the Nagelkerke R square is high in investment, information management and training. This is due to the high variation in companies in these three variables, while employee involvement and deviation from the target have less variation. In the food industry, employee involvement is essential in maintaining quality from raw material to the packing stage, though it depends on the level of automation.

Similarly, the market demand is continuous; hence, the deviation in the target is also less. The probability for passive involvement of employees is 0.15, and the same for active involvement is .58. It shows the variation in management style in which active employee involvement shows the opportunities to take the responsibility of work with a positive attitude, interest, and involvement. The probability for low variation in output is 0.22, and these companies work 'produce to order' or subcontract production.

Table 4: Binomial Logistic Regression models for Machine component manufactures

Model	-2log likelihood	Cox & Snell R square	Nagelkerke R square	Variable equation	Variable	Wald	Odds to probabilities
Investment	30.639	.536	.716	In(odds) = -4.810 +3.315x	x=0 insufficient x=1 sufficient	9.4(p=.000) 17.5, (p=.000)	P (0) =.008 P (1) =.76
Information	30.639	.536	.716	In(odds) = -1.745+3.840x	x=0 informal x=1 formal	9.836(p=.000) 17.48, (p=.000)	P (0) =.148 P (1) =.838
Training	31.639	.532	.706	In(odds) = -1.705+3.140x	x=0: basic introduction x= 1 systematic	9.536(p=.000) 16.48, (p=.000)	P (0) =.154 P (1) =.808

Deviation	45.187	.379	.506	In(odds) =-1.894 +3.784x	x=0: low x= 1: high	5.103(p=.021) 21.78(p=.000)	P (0) = .13 P (1) = .87
Documentation	73.165	.216	.288	In(odds) =-2.398 +5.617x	x=0: Informal x= 1: Formal	5.463 (p=.000) 13.03(p=.000)	P (0) = .083 P (1) = .96
Internal Communication	47.138	.354	.473	In(odds) =-1.504 + 3.030x	x=0: informal x= 1: formal	7.404 (p=.000) 16.723(p=.000)	P (0) =.18 P (1) =.82

Table 6 shows that The -2loglikelihood is low, and the Nagelkerke R square for the machine component manufacturers is high for investment, information, training, deviation, and internal communication. This shows that the variation from the fit mode is less, but there is a significant variation explained in these variables. In the documentation, the explained variation is less. In machine components, investment, information management, training and effective internal communication are essential in maintaining process standards. Though low, a significant value of probability for internal communication (.18), deviation in output (.13), training (.15), and information management (.145) shows that these firms are traditional and focused.

Table 6: Binomial Logistic Regression models for OEMs

Model	-2log likely hood	Cox & Snell R square	Nagelkerke R square	Variable equation	Variable	Wald	Odds to probabilities
Investment	36.845	.475	.638	In(odds) = 1.910-4.107x	x=0 insufficient x=1 sufficient	12.703(p=.000) 20.106(p=.000)	P (0) =.87 P (1) =.104
Information	22.218	.606	.813	In(odds) = -2.351+ 5.647x	x=0 informal x=1 formal	10.096(p=.000) 20.125(p=.000)	P (0) =.087 P (1) =.92
Deviation	58.958	.191	.256	In(odds) =-1.609 +2.420x	x=0: low x= 1: high	11.392(p=.000) 22.78(p=.000)	P (0) = .167 P (1) = .695
specification	64.924	.090	.121	In(odds) = .693-1.386x	x=0: Customer specified x= 1: Company specified	4.16 (p=.000) 10.18(p=.000)	P (0) = .66 P (1) = .33
Profitability	61.121	.154	.207	In(odds) =1.099-1.727x	x=0: low x= 1: high	5.463 (p=.000) 13.03(p=.000)	P (0) = .75 P (1) = .349

Table 7 shows that the OEMs have an insufficient investment in the KM systems (.75) and lower profitability (.75). The products are modified according to the needs of the customers (.66). But the probability for the company specified products is also significant (.33). This shows that these companies are engaged in subcontracting than selling-own brand products in the market. The probability for deviation in output is 0.695.

Discussion

The knowledge management system is essential to an organisation's growth and development of effective control, documentation, and information flow. The data was collected from managers and owners of the firms using interviews and questionnaires. The qualitative data shows that the communication flow could be more informative due to the low information content. It is called information asymmetry. The exchange of information will be effective only when the quality and quantity of information are adequate to explain an idea. The lack of documentation causes missing information at all levels of value in the chain of process,

and the error content inflates. The qualitative data identifies fifteen cases in which order processing, brochure, customised order, product distribution and retailing information, order compilation, pricing and costing, research and development, bill of material, and material issues vary from one industry to another.

The factors that influence the implementation of the KM system in firms were analysed for different control variables: industry (apparel, engineering, food, machine components, and OEMs), management (owner or appointed manager) or the type of ownership.

The apparel industry has adequate investment in knowledge management systems, and it is essential due to the diversity in products, designs, specifications, photos and drawings, material information and value chain in the process. The traceability is crucial as the process is a multi-task value chain. However, the drawback observed is the level of informality in the system. It may be the clarifications orally given to the labours which may not be recorded. This reduces the effectiveness. The ease of communication, quickness of information exchange, and low cost cause the increase in informality in information. The training given to the employees is also systematic. Vital information in the process, like product standardisation (customised or generalised), specification (customer-given or company-designed), process consistency, and deviation from target, is effectively communicated in the system. The orders are either sub-contracting or own products. The probability for one's own product is 0.66.

Engineering firms have job work, and it is not a continuous process. The investment in the KM system needs to be improved, and the information is informal. The probability of getting a firm with formal documentation is just 0.53. This shows that firms need to focus on KM systems more due to the liability of smallness, financial constraints, and skill shortages. The firms refrain from investing in technology and human resources for the KM system as they calculate the opportunity cost of fulfilling more orders.

The food industry is also a continuous process, a multi-tasked value chain in which the information in every stage is important to develop compelling data. This industry also invests adequately in Knowledge management as the hygienic process, quality, quantity, and perfection are important.

The machine component manufacturers are again a subset of Engineering firms and focus more on designing and producing customised products. The Computerised Numerically controlled machine increases production and reduces wastage.

OEMS include electronic industries engaged in assembly lines producing electronic control systems, transducers and sensors, small engineering machines, electronic integrated machines, etc. Lower investment and high customisation are the two constraints in this industry. These firms are sub-contractors and low-profit firms.

The analysis of owners' responses shows that the financial constraints cause them inadequate investment in knowledge management systems and high informality in information systems. However, the firms' managers by managers are more professional, and an effective KM system exists in these firms except for the inadequacy of investment in the KM system. Product standardisation, high deviation in target achievement and non-competitiveness in the market are a few challenges.

The partnership firms have a similar result in managers' responses due to the importance of business control through information management. However, proprietorship firms need financial constraints in implementing knowledge management systems. However, they have a good response in implementing KM systems.

Family business shows a hybrid response of proprietorship and partnership. They maintain an effective KM system.

Limitations of the research and Scope for future research

The analysis is based on sectoral performance to analyse the variation in the effect of different sources of Information asymmetry on developing knowledge management systems. The data includes only five sectors. It could be broadened. Only one geographical location is considered in this research, and it can be

extended to more locations. The analysis can be extended to data and stratified based on different business forms, such as proprietor, partnership, etc.

Conclusion

Information asymmetry is a challenge in any business and causes an ineffective information flow. The analysis must show more investment and a high degree of informality in a communication system in implementing an effective KM system. The proprietors refrain from investing in the infancy level of the growth or fast growth stage as the need for funds in the production process is given higher priority. The partnership firms maintain an effective KM system as it is advantageous to develop an information-based system.

The more informal the operations are; the more information asymmetry exists. The financial constraint and lack of technical acumen are two challenges in developing knowledge Management in small firms. Government intervention is needed to solve this issue.

Implementing an effective KM system to reduce information asymmetry depends on the management of the firm and its commitment. The appointed managers prefer the KM system to owners. The financial constraints limit the development of an effective KM system in any business.

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