

The Role of a Marketing Research Sub-System (MRSS) in Problem Solving: Matoke Micro-processing Project Case Study

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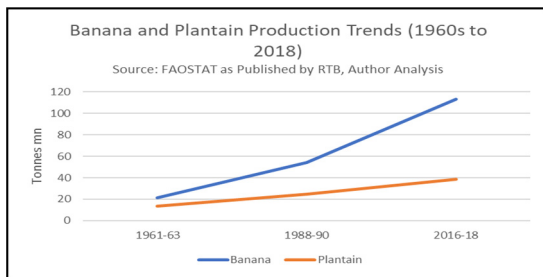
Abstract: Marketing as a customer centered discipline is challenged to make contributions to global problems. Information on providing healthy food is one such challenge. Marketing research is tasked with this important role of information provision. The study uses desk research methodology, reviewing literature to explore how the marketing research information subsystem (MRSS) can be utilized to provide this information. The Matoke micro-processing project aims to produce affordable banana flour and pieces to urban consumers. Findings are that while marketing research is recognized, some challenges in practical application exist. For the Matoke micro-processing project, the specific information sought is identified as stage six of new product development. This has specific information requirements that identified models can be adapted to provide. The suggested model would be integrated into the marketing research system, resident in the product system with specific new product development tasks. Ultimately, it would provide highly customized reports, specific to the project stage. Further areas to consider are supporting projects with research workers and optimizing the new product development process.

1 INTRODUCTION

Marketing is customer centric, as pointed out by management lead-thinker Peter Drucker ‘. the whole business...from the customer’s point of view.’ (Kotler, 1984). The 1970s presented many challenges in economic crises, yet opportunities in technology positioned marketing for an important role in ‘launching a new era of economic activity and raising living standards’. The current global environment has significantly more severe economic crises, presenting an urgent need to accelerate optimization or actualization of technology benefits. It is not clear if marketing and marketing research with this specific role met the earlier global brief, but it is clear now that urgent and effective solutions are required. This study aims to explore and present a working proposition for the role of marketing research in solving current important global problems.

According to the Consultative Group on Agricultural Research (CGIAR), through the Roots, Tubers and Bananas (RTB) - program opportunities for breakthrough research and development were created. Operating between 2012 to 2021, acquiring significant financing of \$750mn and with over 200 partners in Africa - it is considered a model for successful collaborative research (Thiele et al,

2022). Research outputs included specific technologies and innovation such as value addition and processing. The economic importance of RTBs is value addition and employment in rural areas, especially for women. These crops are crucial for Africa Food Security and include cassava, banana, plantain, potato, sweet potato and yam. For consumers, RTBs are vital sources of calories but have received little investment in research and development. Program challenges were in low productivity, diseases, poor storage systems, limited processing and value addition. Success in R & D was recorded, for example in food processing with cassava flour mixed with wheat flour to create composite flour. Bananas and plantains are grown in 101 countries, production trends indicate high growth and a contribution of 27.7% to total value in the RTB category. RTBs represent 25 to 57% of total food in some countries, global supply and demand is mostly in Africa with smaller volumes in Asia and Latin America (Thiele et al 2022).



(Source: Thiele et al, 2000, Author Analysis)

Figure 1: Banana and Plantain Trends.

On a smaller, more focused scale The Matoke Micro processing project is a business concept utilizing a cottage method of preparing Matoke flour and pieces for household consumption, storage, consumer and retails sales. Current value addition to Matoke, (raw uncooked plantain/ banana) is boiled and mashed, stewed and chipped (banana crisps). It's both trendy and traditional, used as a staple food and also as a snack. Why add value to bananas? To provide an affordable and convenient food staple (Hodson, 2018).

2 PROBLEM

Large scale food R & D projects present challenges, demonstrated by the CGIAR RTB program. Stated was that extensive transformation of current processing technology was required to provide these food crops to urban consumers (Thiele et al, 2022). In terms of research priorities, banana and plantain are favorable for poverty reduction although cassava and potato have higher priority. RTB presented innovation clusters as opportunities for postharvest innovation, however no specific banana or plantain research was selected. The clusters present specific attributes for value addition. For the RTB program, the innovation model linked products to the market, research outcomes and development. (Author note: bioengineered RTBs or GMO food products referenced in this and other sections are not promotion of GMO products in view of current African regulatory protocols, or lack there-of in this crop area).

In the African context, a study examining marketing research practice in Tanzania determined most Small and Medium sized enterprises (SMEs) in manufacturing carried out mostly unstructured marketing research. Further, the study established empirically there was no significant relationship between marketing research and business

performance. 66.5% of surveyed SMEs do not utilize structured marketing research. SMEs that utilized structured marketing research reported some positive growth in profits and sales. 69% perceived marketing research as an important activity. As a function, marketing research was considered important for competitive responses in exploiting opportunities in trade and investment and also seen to enhance SME growth. The paper postures that despite tangible benefits strategically – marketing research has not demonstrated adequate value to SMEs. Also, existing theory does not accurately predict how SMEs act. The study recommendations include a more systematic and coordinated approach to the application of marketing research strategies and resources This is the study gap (Nyamanza, 2021).

Within the EAC region, a study report from Tanzania and Uganda examined the market research function and identified marketing and selling as specific problems - namely; limited information on markets of operations; few market assessments and analysis due to knowledge and skills gap; few products and services, limited identification of opportunities for diversification; inadequate linkages in agri-food chain; limited feedback to processors and producers (Dietz et al, 2000) This is a broad based research problem that the study research questions will seek to further refine and clarify.

2.1 Working Proposition and Research Questions (RQs)

Working proposition:

Marketing Research Subsystems have an important role in project problem solving.

Research questions:

RQ1: What are the marketing research problems in the Matoke Micro-Processing Project?

RQ2: What marketing research subsystem model can be developed to address these problems?

RQ3: What is the overall role of the marketing research subsystem for the project?

2.2 Paper Research Methodology

The research methodology is desk research using literature review, case study and modelling. Current thought on context specific studies, such as localized case studies in producing and obtaining acceptance are considered and addressed. Context-specific refers to the limited generalizability to other contexts and other findings. This can be unique content and/or limited generalizability of findings.

Typically, marketing pursues a scientific approach hence proposition, hypothesis, findings. Overall, the study pursues this, with a working proposition and research questions. Context specific studies can add value in three ways: higher validity (accuracy & precision) to specific context, higher importance to specific context; and higher creativity and innovation in this area. To broaden generalizability the paper looks at global research, across industries, utilizing established texts, widely used journals and standard accepted modeling. The study adds accuracy, importance and creativity to the specific context by immersing in industry-rich publications in, using an in-depth case specific project, materials documented, reviewed and published over five (5) years and adaptive modelling to address case problem. (Stremerch et al, 2022)

3 LITERATURE REVIEW

3.1 Working Proposition

Marketing research is defined as ‘identification, collection, analysis and dissemination’. Further, as ‘a process with opportunities and problems, actions’. The activities involve ‘information, methods, data collection, results, findings and implications/communications’ (Malhotra, 1996). Implicit in this definition is that marketing research aims to identify opportunities and problems, then propose solutions. This is a process utilizing information resources. Important is communication of the solution. The importance of research and its role is therefore as a problem-solving process. Other definitions of marketing research include ‘search for knowledge’ or ‘scientific and systematic search for pertinent information on a specific topic’ and ‘academic process of defining and redefining problems, formulating hypothesis or suggested solutions, collecting and evaluating data, making deductions and reaching conclusions, carefully testing conclusions to ensure a fit to the hypothesis/suggested solution’. (Kothari & Garg, 2004). There is a differentiation between market research and marketing research (CIM, 1994). Marketing research refers to ‘all elements of the marketing mix (price, product/service, promotion etc.’. Market research is in markets (sizes, segments, trends, market shares). According to Daniel et al (2021) marketing research is 'providing information for marketing decision-making'. Also, market research focuses on markets, marketing research aligns with marketing processes. Projects are

pre-defined sets of activities with specific objectives, fixed resources and a time frame. Due to their nature, marketing research requirements would inherently be different. Therefore, marketing research for projects should be: set to achieve specific project objectives; designed to utilize allocated project resources; implemented within project stipulated time frame.

3.2 RQI: Marketing Research Problems

Sustainability - a popular term is mostly used in reference to the environment. Marketing sustainability is concerned with customers and businesses, creating socially responsible marketing and practiced in different sectors, including public, private and non-governmental.

Sousa et al (2003) discuss the role of value design of for marketing sustainability. Their marketing definition is ‘assessing information needs, implementing a research process and communicating findings, while also useful in monitoring the firm performance.’ Most researchers insist high performing businesses use marketing research, generated internally rather than externally. It is preemptive and practical, not responsive. (Sousa et al, 2003). The importance of sustainability to both marketing research and products/services outputs is stated, while clarity of the research process is also important.

Aligned with this classification of research by Malhotra, (1996) two main categories are presented: problem solving research involving segmentation and correcting marketing principles; and problem identification research, concerned with market potential. The above problem is analyzed to determine classification, approach and focus. The relevant problem is few products and services with limited identification of diversification opportunities. An MRSS that is problem solving in nature and can; first, identify products and service options; second, identify diversification opportunities is therefore the study focus.

For the Matoke Micro-processing project, the basis of projections as per a conference paper from a Tanzanian national perspective consider sales value of app \$2600/hectare; gross margins of 50%; retail margins of 400%. The projects’ current key goal is development, launch and commercialization of Matoke flour and pieces, creating a sustained project for micro-processing, training and sale of end-consumer products: Project short term objectives are to secure start-up capital of \$3900; set up a pilot

project; maintain positive project cash flows. Longer term financial objectives are: achieve payback within 11 months; achieve a 20% net margin (Hodson, 2018)

Table 1: NPD Process-Project Stage (Source: Hodson,2018).

New Product Development Stage	Summary Details
1.Idea generation	Ideas generated with range of value added processed banana products identified
2.Idea screening	Ideas screened and 2 potential ideas selected
3. Concept development and testing	Product concept developed and utilized at home-based level
4. Marketing strategy development	Marketing strategy with product line, retail pricing, promotions developed
5. Business analysis	Profitability analysis carried out at farm-level, farmer and retail margins
6. Product development	Prototype pending
7. Market testing	Testing pending
8. Commercialization	Commercial sales pending

3.3 RQ2: Marketing Research Subsystems

A theory is ‘interrelated concepts that explain facts’, while a model is a ‘system representation and can be descriptive, explanative or simulation. (Cooper & Schindler, 2000). The study examines two theoretical models. Kotler (2000) defines Marketing Research System as ‘the systematic design, collection, analysis and reporting of data and findings relevant to specific marketing situations facing the company’.

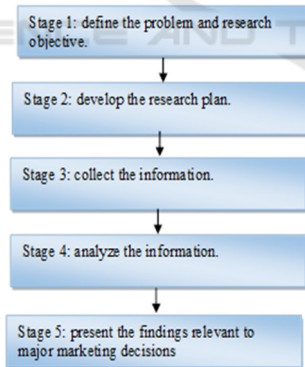


Figure 2: MRSS Model 1 (Source: Kotler, 2000).

Basandra (1999) defines market research subsystem as describing firm’s marketing transactions. Types of data are either on customers or prospects, both primary and secondary sources, collected by the firm or other parties.

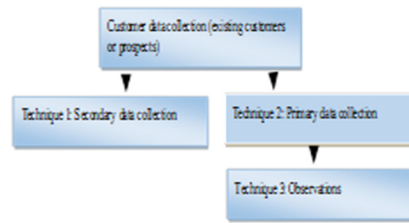


Figure 3: MRSS Model 2 (Source: Basandra, 2000).

3.4 RQ3: Role of MRSS

Possible generic roles of marketing research, subject to adjustment for project purposes are: first, rationale (or why) for example to provide information. This could be strategic direction (CIM, 1994) due to widening gaps between organizations and customers caused by complex competition, technology change, changing consumer markets and higher marketing costs. This could also be for a specific purpose. (CIM, 2000). The researcher is required to set clear objectives then follow a specific research process: second, for a purpose based on structure within MKIS of storing specific studies on marketing problems, opportunities and effectiveness. It must interact with other MKIS subsystems (CIM, 1994); thirdly, for a purpose based on systematic process, for example to answer questions by applying the procedure. This could be to understand a phenomenon, describe characteristics, to determine frequency of an occurrence, test the hypothesis of causal relationships (Kothari & Carg, 2004). In summary, the overall MRSS role could be to provide information, to store information or to implement research.

4 MAIN FINDINGS

4.1 Working Proposition

The problem-solving importance to projects can be seen by considering a similar product type – sweet potato. This done in a Ugandan study examining its health role and impact of processing. Modern lifestyles have led to an increased consumption of unhealthy foods and incidence of Non-Communicable Diseases (NCD): These include: stroke, cardiovascular disease, inflammatory conditions, metabolic conditions and diabetes, chronic respiratory diseases, chronic kidney diseases, cancer. These are projected to increase during 2000 to 2030 globally, from 60% to 70% and in Low Income Countries, from 27% to 50%. Food

based approaches are seen as 'cheaper and more sustainable' than medications in treating NCDs. Sweet potato is well suited due to its combined features of high starch in cereals, vitamins and peptides in fruits and high vitamin and minerals in vegetables. Overall, it is high in nutritional value, an important starch staple that is also drought resistance. It can therefore be used for food and nutrition security. Further studies on the effect of food preparation and processing on sweet potato and access to bio-compounds are suggested. In this case, MRSS determines a health benefit that can potentially be delivered, pending research on food alteration by processing. It therefore provides important preliminary health information (Amagloh et al, 2021).

For the Matoke micro-processing project, the following possible MRSS roles have been identified. The first role could be to provide information. This may be in two ways – in strategic direction to provide a convenient, tasty, affordable starch food staple product. This could also be through stating specific objectives in line with the key goals of development, launch and commercialization of Matoke flour and pieces. Second, an MRSS could store marketing data on problems, opportunities and effectiveness: problems are inadequate food starch staples; opportunities are in processing available food products; effectiveness is in successful launch of the food product. Thirdly, the project MRSS could answer specific questions by applying the research procedure. What model MRSS is required and how can it be used to achieve project objectives?

4.2 RQ1: MRSS Problems

The research question implies, priority is required in defining the problem domain. An example is a study that sought to evaluate food prescriptions as an intervention (Little et al, 2021). Food prescriptions are specific interventions for food insecure (FI) patients at risk of health related diseases. There are interventions to subsidize or provide healthy foods. 'Food as medicine' is an approach gaining popularity in North America aiming to improve 'access, affordability, convenience and desirability of safe and healthy foods, including whole grains, fruits and vegetables. The global context is that suboptimal diets account for 18% of deaths and 10% of disability adjusted lifestyles (DALYs) as reported by the Global Study on Disease Burden Study (2016). Poor diets are low in whole grains, fruits and vegetables. Diet behavior and consumption result

from varying factors, among which are 'affordability and pricing, vendor and product features'. The research methodology reviewed abstracts and manuscripts, determining food prescriptions are promising interventions in improving fruit and vegetable consumption and reducing food insecurity. However overall health impact in these studies was seen as weak. A barrier to implementation was 'poor quality produce at participating retailers'. More studies are recommended to further investigate health impact of the programs (Little et al, 2021). This implies that while information on interventions was required, health impact was a priority for providing adequate research.

The Matoke micro-processing project has already identified the main problem domain as few products and services and limited identification of opportunities for diversification. In identifying products and service options the following were product/service options generated: Matoke generic product type, Matoke product original form, Matoke processed product forms, Matoke nutritional analysis and Matoke value addition process. In identifying diversification opportunities in product (not market) diversification, the following options and opportunities were identified: new product characteristics, new product packaging, new product pricing and new product placement.

4.3 RQ2: MRSS Models

Soltész et al (2003) utilize a classic project management system, whereby successful product development is seen as a common challenge to both technical and managerial teams. They state success factors include: precision regulation and focus on collaboration; knowledge management and collaboration within units; defining project success and utilizing lessons learnt or module information; improving project processes and utilizing time better and provide more valuable products to customers. Project management is about risk and has an impact on investment and production. Risks are generally associated with reception of the product in the market. In a survey design, utilizing a questionnaire sent to one hundred and twelve (112) experts, a specific section handled information for the future. This dealt with three (3) areas: project feedback meeting and collecting lessons learnt, lessons learnt database, module database. Findings indicate a high rating on clarification of project goals with more importance given to project feedback than databases (Soltész, 2003). When applied to the current MRSS study, projects require a management framework

with objectives and information is important. The MRSS is therefore a good focus for project success as it has both.

Further examination of newly developed technology models is carried out to develop MRSS systems specifications. In selecting information systems, several considerations can be made. Delone and MacLean Information Systems Success Model (2003) has dimensions with measures that can be used in assessment. For the Matoke Micro-processing project, based on project characteristics and aligned with the study working propositions - systems quality is an indicative dimension with the following measures five (5) measures: systems features, efficiency, response time, ease of use and systems accuracy.

Table 2: Two MRSS model options analysis (Sources: Delone & McLean, 2003 and Author analysis).

Delone and Mclean Systems Quality Dimension Measures	Kotler Model - Rates	Basandra Model - Rates
Systems features (30)	The model is a process, with sequential logical steps. This aligns well with the project that has a methodology and plan. (25)	The model is technique based, focusing on actions. This is also aligned to the project that has specific activities. (20)
Efficiency (30)	Resources required to follow all steps are larger in both time and knowledge (15)	The techniques are few and specific (20)
Response time (20)	The project time frame requires time-scaled outputs. The process model has indicative time frame up-to results presentation (15)	No clear indications of time are presented (5)
Ease of Use (10)	The process model has details and guidance on what the user needs to do (8)	The model simply lists what activities constitute research (3)
System accuracy (10)	The process collects and evaluates data, providing information. Therefore data is checked and the results are presented (7)	The activities could present data and information without clarity on its accuracy (2)
Total 100	70	50

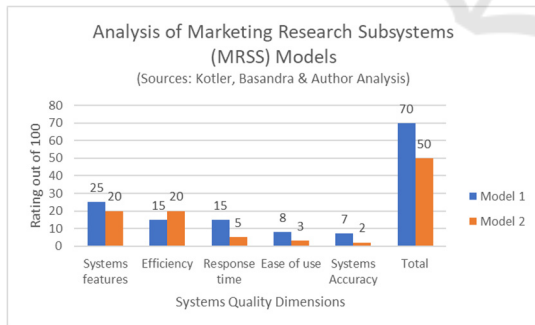


Figure 4: Results of Model suitability: (Source: Author).

4.4 RQ3: MRSS Role

Practically, this MRSS study examines research and the roles assigned to it. In Africa’s biggest economy, Nigeria – research in a leading growth sector of SMEs indicates marketing research can provide needed information and enable SME survival (Daniel et al, 2021). The problem is that 80% of

SMEs did not have a business plan and most new products were launched without an enquiry into customer needs and wants. The role of marketing research was therefore to assess and provide information for sound marketing decisions. Marketing research was seen as a transformational function - changing the orientation of business 'from producing what you can sell rather selling what you produce' implying a market-oriented method of doing business. An important role of research was to monitor the environment and avert undue risks/uncertainty. The specific research problems identified were lack of proper identification of research problems in industry. The study conclusion with recommendations indicate marketing research is important and should be conducted before and after production. Its role can enhance and provide better products and services for increased customer satisfaction, profitability and sustainability (Daniel et al, 2021).

For the MRSS study purpose, the overall roles is to provide information on product/service and diversification options. Specifically, information on the current stage of product development is needed. A complete Marketing Information system (MKIS) review is a necessary starting point. NPD data and information are stored in the NPD subsystem with indicative features according to Kotler (2000) as: organized to gather, generate and screen new product ideas; carry out adequate research and analysis before investing in new ideas; for adequate product and market testing. At this point, it is evident that an NPD subsystem is required. This can only be identified and utilized by evaluating full Marketing Information Systems (MKISs). For simplicity and consistency, two MKIS models can be examined from the same sources/authors. Kotler (2000) presents an MKIS with MRSS as a core processing subsystem with no NPD. However, there is a report output for product decisions. Basandra (1999) presents an MKIS with MRSS as an input subsystem featuring a database for processing and product system as outputs. Within this is a New Product evaluation model that is quantitative, presenting rationale for introducing new products by analyzing utilization of manufacturing and marketing resources. Qualitatively assessing these two models, neither can be well applied for project purposes. Following the paper findings, the NPD process can be adapted to give guidance on specific research at product development stage. The result is indicative model for a project MRSS.

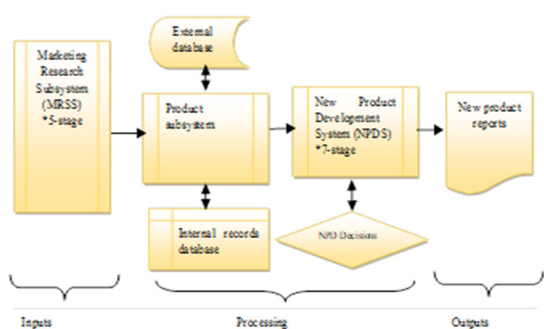


Figure 5: Integrated MRSS with NPD (Source:Author).

System Section	Report details
Marketing Research Subsystem	Report requesting research on banana processing product extension
Product System	Report evaluating products and options
New Product Development System	New product development stage report with objectives: 1) Demonstrate technical and commercial feasibility 2) Develop a physical product i.e. a prototype 3) Test the prototype using alpha & beta methods. *Research techniques: rank-order, paired comparison, monadic rating.

Figure 6: Sample Project Report (Source: Author).

5 CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

5.1 Conclusions

With regard to the working hypothesis, an MRSS can be integrated or re-configured to have an important role in project problem solving. 3 specific roles could be; to provide information, to store marketing data and to implement the research process. The Matoke Micro-processing Project identifies the most important role for an MRSS is to provide information.

The Research Questions have been answered as follows: In RQ1, research can be problem-solving or problem identification. The Matoke Micro-processing project is problem solving research, related to product. For RQ2, two (2) MRSS models are presented for review, a Kotler model with seven (7) sequential processes, and a technique-based model by Basandra with three (3) specific research activities. Upon evaluation with the famous Delone and McLean Information Success System model, five (5) dimensions of systems quality relevant to the project are reviewed namely; systems features, efficiency, response time, ease of use and accuracy. Model 1 scores 70/100, while Model 2 scores 50/100. RQ3 finds that in determining the role of MRSS in providing information, an integrated

MRSS model can be developed with features of a core MRSS subsystem, linked to a product system with a New Product Development Subsystem (NPDS). Linked to these are external and internal databases with decision points and New Product report outputs which are clear and implementable. This will provide a complete input, processing and output systems as per the Information Systems concept.

5.2 Implications

In projects, a complete MRSS should be an important consideration. The MRSS should have clear research objectives aligned to overall project objectives. Modelling MRSS is complex and requires integration within the complete, documented and functioning MKIS. The benefits of an MRSS are derived from specification or customization as projects tend to have complex research needs. This supports MIS research that suggests flexible systems are needed. The MRSS requires high user knowledge of both project areas and research as a function. These should be considered in project teams structures.

5.3 Recommendations

A complete and documented NPD Subsystem would be advantageous. This would complete all the defined NPD process stages. The MRSS models can be further assessed to ensure efficient integration with emerging project specific needs.

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