Determinants of the leather technology adoption by artisan/SMEs in the leather footwear and leather goods manufacturing in Kenya

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Abstract

- Leather industry has potential to contribute to national GDP
- SMEs play a key role in the economy
- SME have challenges such technology and finance
- Technology adoption has huge impact on quality and quantity
- A survey was done to understand the factors affecting technology adoption by SMES in leather
- Finance and adequate skills were the leading factors
- Government interventions can catalyze adoption

Introduction

- Leather goods industry produces a range of consumer products: footwear, garments, handbags etc.
- Leather goods manufacture has potential of transforming economies of developing countries
- Footwear manufacturing and leather goods manufacturing technologies have tremendous changes over the years
- MSEs in leather sector of Kenya play a key
- Faced with technological challenges among others

Introduction

- **Technology** can be described as the integration of people, knowledge, tools and systems with the objective to improve people's lives *(Porter, 1985).*

- **Technology incorporates**; design, research and development, process and production engineering, maintenance, management and entrepreneurship, marketing, investment and finance, human resources, information technology, among others things. *(Betz, 1998).*

- **Manufacturing technologies** are defined as the "master tools of industries that blow up the efforts of an individual worker and enable production of all manufactured goods, they include; Design- CAD, CAE, CPP; Manufacturing AM GT, FMS; Administrative technologies, ERP

Introduction

- In the global business environment, technology is one of the salient elements for remaining competitive
- **Technology adoption** has emerged as an important determinant of competitiveness in current global trade
- Technology can be viewed as a strategic weapon to achieve sustainable competitive advantage and support the competitive strategy of the firm.
- Advanced Manufacturing Technology (AMT) has been considered as a viable solution to improve efficiency and lower costs of manufacturing firms and it has taken a determining role in this process.

Introduction- Technology adoption

- **Technology adoption**: The choice to acquire and use a new invention or innovation.
- **Technology adoption step process:** Awareness, assessment, acceptance, learning, usage
- **Top barriers to technology adoption;** Cost, Skilled manpower, lack of awareness of benefits, poor infrastructure.
- **Technology diffusion:** The process by which something new spreads throughout a population.
- Every technology goes through an adoption cycle ranging from early adopters to people who never adopt.

Introduction

- Kenya expects SMEs to play a central role in employment, industrial transformation and poverty reduction.

- Overcoming the challenges relies on the SMES adopting new technologies and knowledge accumulations .

Methodology

Data collection and analysis

- Secondary data collection and desktop studies were carried out
- Primary surveys and use of questionnaires,
- Quantitative data analysis
- Data analysis

Key research questions

Results and Discussion

Demographic characteristics; *Male 90%, Female 10 %*

State of Ownership; *Domestic 96 %, Foreign owned 4%*

Organizational ownership structure of the Firm; *Sole proprietorship 95%, Limited company 3%, Cooperative 1%, Others 1%*

- **Sectorial Distribution Firms**

Sector	Percentage
Leather Footwear only	42
Other Leather Goods only	23
Leather Footwear and other Leather Goods	35
Total	100

Results and discussion

Size of firm Based on No. of employees; Micro- 93%, SMEs 7%

Years of operation; <5 , 16%; 5-10, 35%;10-15, 21%; 15-20, 14%; >20, 14%

Certification; None-94%; KeBS-6%; ISO-%

STATE OF TECHNOLOGY ADOPTED

S/ No.	Manufacturing stage	State at Developed countries	State at Kenyan SMEs
1.	Design	CAD, shoe master CAD, CAM, Lining marking pencils, lining marking patterns,	Pencils, patterns, rubber,
2.	Clicking/ Cutting	Steel rule, dies, clicking press, sole trimmer, leather splitter, cutting machines, universal punching machine, trimming knife, marking bench, cutting press, clicking bench,	Knives, scissors, hammer, mallets, locally made punching numbers, working bench, dies, clicking bench
3.	Splitting	Leather splitter, splinter.	Knives
4.	Skiving	Skiver, skiving knives, skiving machine, trimming machine.	Knives, Skiving machines
5.	Assembling/ Sewing/ Stitching	CAD, solid works, hole puncher, folding machines, roughing machine, sock embosser, riveting machine, harness snitcher, Post machine, cylinder bed, thread trimmer, steam machine, piping machine, eyelet enforcing machine, eyelet enforcing puncher, lacing string	Hole puncher, strings, Flatbed sewing machines, harness snitcher
6.	Heating	Heat setting machine, humidifier,	Paraffin Stove, modified humidifiers
7.	Lasting	Insole last, insole lasting tacks, insole tacking hammer, cement lasting adhesives, cement lasting brushes, cement lasting pliers, cement lasting hammers, shank attaching machine, lasting jack, lasting heater, pincers, lasting knife, bench, heel seat machine, tack nails, toe forming machine, molding machine, heat activator, automatic lasting and de-lasting machines	Insole last, insole lasting tacks, hammer, glue/ adhesives, lasting brushes, pliers, hammers, shank attaching machine, lasting jack, lasting knife, bench, tack nails,
8.	Finishing and packaging	Spray guns, polishing machines, spraying booth, tapes,, cement spraying machine, folding machine, pressing machine, polishing ink, stamping/embossing machine, foil,	Modified grinder, spray guns polishing ink, brush,

Status of hard and soft leather technology adoption by the SMEs

Types of technology	Freq.	%	Cumulative %
Soft technology			
Adopted	0	0	**0**
Not adopted	81	100	**100**
Total	81	100	
Hard technology			
Adopted	0	0	**0**
Not adopted	81	100	**100**
Total	**81**	**100**	

DELIMITING FACTORS FOR TECHNOLOGY ADOPTION BY SMES

Delimiting factor affecting leather technology	Total No. of resp.	Delimiting type of technology adopted							
		Soft technology				Hard technology			
		Yes		No		Yes		No	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
Competition from other leather firms	81	67	83	14	17	26	32	55	68
Meeting Customer demands	81	10	12	71	88	53	65	28	35
Human resource in technical skills	81	81	100	0	0	6	7	75	93
Supply of technology	81	81	100	0	0	6	7	75	93
Top management commitment	81	9	11	72	89	11	14	70	86
Environmental sustainability	81	7	9	74	91	76	94	5	6
Availability of finance	81	81	100	0	0	81	100	0	0
Government support	81	81	100	0	0	81	100	0	0

Adoption of soft technologies

Adoption of soft technologies			
Competition	1.76		
Customer demand	0.743		
Human Resource Technical skills	2.270		
Supply of technology	0.387		
Top management commitment	2.254		
Environmental sustainability	0.692		
Government support	1.325		
Availability of finance	2.325		

Adoption of hard technologies

Adoption of Hard Technologies			
Competition	1.722	1	0.000
Customer demand	0.661	1	0.024
Human Resource Technical Skills	1.861	1	0.002
Supplier of Technology	0.541	1	0.258
Top management commitment	0.242	1	0.001
Environmental sustainability	0.770	1	0.017
Government support	1.715	1	0.002
Availability of finance	1.987	1	0.001

STRATEGIES TO EMPLOY TO ADDRESS TECHNOLOGICAL GAPS

1. Finance/Capital provision
2. Technical Human resource
3. Government support e.g. tax on imported leather machines.
4. Competition

Conclusions

- SMEs are using outdated hard technologies and yet to upgrade
- No SMEs had adopted the use of soft andhard technologies
- Finance and Technical skills were the major limiting factors
- Others are management decision and competition
- Government can play key-role in intervening on the two major factors Finance and technical skills training and provision of equipment.

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