

**Development of Blockchain-based Web Application to Improve Raw Material  
Supply Chain Traceability: Case of Stingray Leathercraft**

By

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in

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## STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.



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## ABSTRACT

### DEVELOPMENT OF BLOCKCHAIN-BASED WEB APPLICATION TO IMPROVE RAW MATERIAL SUPPLY CHAIN TRACEABILITY: CASE OF STINGRAY LEATHERCRAFT

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This study develops a web application using Ethereum blockchain to trace stingray leather products in the supply chain. The study aims to build the web application and evaluate its advantages, disadvantages, and cost feasibility. The frontend of the web application is developed using the scaffold-eth template and deployed to the IPFS network. The web application undergo testing that includes unit and functional testing. The smart contract is deployed on the Sepolia Testnet and the web application on IPFS nodes. Gas usage cost data is collected for cost analysis which evaluates smart contract deployment and function execution expenses. Comparison of the web application with blockchain and non-blockchain versions is compared, highlighting differences in architecture, flow, and user interaction. Furthermore, advantages and disadvantages of the web app is evaluated in this study. The research shows that blockchain enhances supply chain transparency but incurs costs. Based on the UMKM scenario in this study, the monthly cost of the supply chain web application using the Ethereum blockchain does not exceed thirty percent of UMKM with a monthly revenue of \$10,000 ( $\approx$  Rp. 149,538,500) which could be considered feasible if the supply chain web application is to be used as a main component of their business.

*Keywords: Blockchain Web Application, Ethereum Blockchain, Supply Chain Traceability, Stingray Leathercraft*



## **DEDICATION**

I dedicate this work to my friends, my family, who have supported me from the start, and my own country, Indonesia . May this study be beneficial to humanity as a whole.



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## TABLE OF CONTENTS

	Page
<b>STATEMENT BY THE AUTHOR</b>	<b>2</b>
<b>ABSTRACT</b>	<b>3</b>
<b>DEDICATION</b>	<b>5</b>
<b>TABLE OF CONTENTS</b>	<b>7</b>
<b>LIST OF FIGURES</b>	<b>9</b>
<b>LIST OF TABLES</b>	<b>11</b>
<b>CHAPTER 1 - INTRODUCTION</b>	<b>13</b>
1.1 Background	13
1.2 Research Problems	15
1.3 Research Objectives	15
1.4 Significance of Studies	16
1.5 Research Questions	16
1.6 Hypothesis	16
1.7 Research Scope	17
1.8 Research Limitation	17
<b>CHAPTER 2 - LITERATURE REVIEW</b>	<b>18</b>
2.1. Theoretical Definition	18
2.3 Related Works	28
<b>CHAPTER 3- RESEARCH METHODS</b>	<b>37</b>
3.1 Research Overview	37
3.2 Requirements Gathering	37
3.3 System Design	38
3.4 System Development	48
3.5 System Testing	49
3.6 System Deployment	50
3.7 Gas Usage Cost Data Collection	50
3.8 Web App Cost Analysis	51
3.9 Web App Evaluation	51
<b>CHAPTER 4 - RESULTS AND DISCUSSIONS</b>	<b>52</b>
4.1 System Development	52
4.2 System Testing	87

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<b>4.3 System Deployment</b>	<b>90</b>
<b>4.4 Gas Usage Cost</b>	<b>94</b>
<b>4.5 Web App Cost Analysis</b>	<b>97</b>
<b>4.6 Web App Evaluation</b>	<b>104</b>
<b>CHAPTER 5 - CONCLUSIONS AND RECOMMENDATIONS</b>	<b>112</b>
<b>5.1 Conclusion</b>	<b>112</b>
<b>5.2 Future Works and Recommendation</b>	<b>114</b>
<b>GLOSSARY</b>	<b>117</b>
<b>REFERENCES</b>	<b>123</b>
<b>CURRICULUM VITAE</b>	<b>127</b>





## LIST OF FIGURES

Figures	Page
<b>Figure 1. Top 10 Countries of Stingray Exporter (“Frozen Stingray global exports and top exporters 2023,” n.d.).....</b>	<b>14</b>
<b>Figure 2. Research Methodology Diagram.....</b>	<b>37</b>
<b>Figure 3. Use Case Diagram.....</b>	<b>39</b>
<b>Figure 4. Activity Diagram.....</b>	<b>41</b>
<b>Figure 5. Architecture Diagram .....</b>	<b>43</b>
<b>Figure 6. Input Data to Block .....</b>	<b>44</b>
<b>Figure 7. Block Structure .....</b>	<b>45</b>
<b>Figure 8. Transaction Structure .....</b>	<b>47</b>
<b>Figure 9. Smart Contract UML Diagram.....</b>	<b>53</b>
<b>Figure 10. addUser Pseudocode.....</b>	<b>54</b>
<b>Figure 11. addProduct Pseudocode .....</b>	<b>55</b>
<b>Figure 12. transferProduct Pseudocode.....</b>	<b>56</b>
<b>Figure 13. addUserHistory Pseudocode.....</b>	<b>57</b>
<b>Figure 14. Approve Product History.....</b>	<b>57</b>
<b>Figure 15. Web App Product Traceability .....</b>	<b>59</b>
<b>Figure 16. My Products Page Empty .....</b>	<b>60</b>
<b>Figure 17. Add New Product Page .....</b>	<b>60</b>
<b>Figure 18. Create Product Metamask Popup.....</b>	<b>61</b>
<b>Figure 19. Local Transaction Sent.....</b>	<b>62</b>
<b>Figure 20. Create Product Transaction Details.....</b>	<b>62</b>
<b>Figure 21. Decoded Input Data .....</b>	<b>63</b>
<b>Figure 22. Products Page Updated I.....</b>	<b>64</b>
<b>Figure 23. Product History Page Empty .....</b>	<b>65</b>
<b>Figure 24. Create User History Page.....</b>	<b>65</b>
<b>Figure 25. Create User History Metamask Popup.....</b>	<b>66</b>
<b>Figure 26. Create User History Transaction Details I.....</b>	<b>66</b>
<b>Figure 27. Product History Page Updated I .....</b>	<b>67</b>

<b>Figure 28. Product History Information</b> .....	<b>68</b>
<b>Figure 29. My Products Page Updated I</b> .....	<b>68</b>
<b>Figure 30. Transfer Product Metamask Popup</b> .....	<b>69</b>
<b>Figure 31. Transfer Product Transaction Details I</b> .....	<b>70</b>
<b>Figure 32. My Products Page Updated II</b> .....	<b>70</b>
<b>Figure 33. Products Page Updated II</b> .....	<b>71</b>
<b>Figure 34. My Products Page III</b> .....	<b>71</b>
<b>Figure 35. Create User History Crafter</b> .....	<b>72</b>
<b>Figure 36. Create User History Transaction Details II</b> .....	<b>72</b>
<b>Figure 37. Product History Page Updated II</b> .....	<b>73</b>
<b>Figure 38. Transfer Product to Distributor</b> .....	<b>74</b>
<b>Figure 39. Transfer Product Transaction Details II</b> .....	<b>74</b>
<b>Figure 40. Products Page Updated III</b> .....	<b>75</b>
<b>Figure 41. Create User History Distributor</b> .....	<b>76</b>
<b>Figure 42. Create User History Transaction Details III</b> .....	<b>77</b>
<b>Figure 43. Products Page Updated IV</b> .....	<b>78</b>
<b>Figure 44. Transfer Product to Retailer</b> .....	<b>79</b>
<b>Figure 45. Transfer Product Transaction Details III</b> .....	<b>80</b>
<b>Figure 46. Products Page Updated V</b> .....	<b>81</b>
<b>Figure 47. Create User History Retailer</b> .....	<b>82</b>
<b>Figure 48. Create User History Transaction Details IV</b> .....	<b>83</b>
<b>Figure 49. Product History Page Updated IV</b> .....	<b>84</b>
<b>Figure 50. Transfer Product to Customer</b> .....	<b>85</b>
<b>Figure 51. Transfer Product Transaction Details IV</b> .....	<b>86</b>
<b>Figure 52. Products Page Updated VI</b> .....	<b>87</b>
<b>Figure 53. Smart Contract Deployment on Sepolia network</b> .....	<b>91</b>
<b>Figure 54. Smart Contract Deployment transaction details on Sepolia network</b>	<b>91</b>
<b>Figure 55. Smart contract's related transactions list</b> .....	<b>92</b>
<b>Figure 56. Smart contract's events log</b> .....	<b>93</b>
<b>Figure 57. Architecture Diagram Comparison</b> .....	<b>105</b>
<b>Figure 58. Web App Without Blockchain Activity Diagram</b> .....	<b>108</b>

## LIST OF TABLES

Tables	Page
<b>Table 1. Blockchain Platform Comparison Table (Takyar, 2022) .....</b>	<b>20</b>
<b>Table 2. Comparison between Mainnet and Testnet (ImmuneBytes, 2022).....</b>	<b>24</b>
<b>Table 3. Related work comparison table .....</b>	<b>36</b>
<b>Table 4. Smart Contract Unit Test Hardhat Local Blockchain.....</b>	<b>88</b>
<b>Table 5. Smart Contract Unit Test Sepolia Network.....</b>	<b>89</b>
<b>Table 6. Web App Functionality Test .....</b>	<b>89</b>
<b>Table 7. Gas Usage I .....</b>	<b>94</b>
<b>Table 8. Gas Usage II.....</b>	<b>96</b>
<b>Table 9. Gas Usage III .....</b>	<b>97</b>
<b>Table 10. Web App Cost Estimation with Ethereum Blockchain .....</b>	<b>100</b>
<b>Table 11. Web App Cost Estimation with AWS .....</b>	<b>102</b>

## LIST OF EQUATIONS

Equations	Page
<b>Equation 1. Web App Total Cost Ethereum.....</b>	<b>100</b>
<b>Equation 2. Web App Monthly Cost Ethereum .....</b>	<b>100</b>
<b>Equation 3. Web App Monthly Cost as a Percentage of Revenue Ethereum....</b>	<b>100</b>
<b>Equation 4. Web App Total Cost AWS.....</b>	<b>102</b>
<b>Equation 5. Web App Monthly Cost AWS .....</b>	<b>102</b>
<b>Equation 6. Web App Monthly Cost as a Percentage of Revenue AWS.....</b>	<b>102</b>
<b>Equation 7. Web App Cost Difference .....</b>	<b>103</b>

