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"OffOptimizer" - Optimal quotation planning for the offset printing industry

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Human beings have diversified communication modes and among them print media has become one of the main modes for mass communication. Although there are many methods of printing, offset printing is identified as the most cost effective method for large quantity. Usually, the customer either provides the idea of the printing work or the artwork to the Printer. These print orders involve different types of printing including books, banners, leaflets etc. The printing task is challenging when it involves printing of different shapes with varying colours as the printer has to give the most economical quotation for the customer and earn a profit while providing an efficient and a quality service. In the medium and small scale printing industry, quotation preparation is usually done manually. The best quotation for the printer is the one that maximizes the number of shapes that can be cut from a given paper size. This involves many calculations mostly done manually, by skilled estimators which is a tedious as well as a time consuming job. Literature and a market survey revealed that the manual preparation of quotations is a significant barrier in the development of the medium and small scale printing industry. The project "OffOptimizer" presented in this paper address these limitations in the offset printing industry by providing an automated web based software solution. Hence the aim of this project is to implement a software system that can be used to efficiently generate a cost effective quotation for any given design pattern by optimizing the analysis phase. The inputs to the system are the image to be printed, the size of the paper and the quantity required. The softcopy of the input print matter is given in a white background and this print matter is converted to a web DPI (dots per inch). Following the DPI converting process the system makes new images by placing the print matter in different angles to decide the maximum number of shapes that can be cut from each angle. At this point a human can make the decision on what is the best angle to cut the shapes or else choose the advanced option to enable developing of the tessellation by mixing different angles. Once the most suitable model is identified the system will calculate the cost according to the given paper size. Given the input parameters the OffOptimizer is able to suggest the most suitable type of printing machine *i.e.* two-colour, four-colour etc. out of the available machines. The total solution for a given job is saved for repeated work. The user acceptance of the final system is 87% for efficiency, accuracy, user friendliness, and cost effectiveness.

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