



## Decision Support System for Diagnosis of a Color Spot in Dermatology

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**Abstract -** Today more than thousand diseases are observed in dermatology and they are classified in different types of disorders. In dermatology, color is one of the important parameter to describe the basic lesion. Analysis of color, along with the value of additional parameters of a disease, helps in diagnosis of the disease. The paper presents the model of Decision Support System for diagnosis of color spot in Dermatology. Depending on the color of the spot, the system interacts with the user by asking several queries based on the symptoms and signs related to a set of diseases until the provisional diagnosis is made. The knowledgebase is designed to store information related to various diseases along with symptoms and clinical signs.

**Keywords—** Decision Support System, Color spot, Dermatology, Knowledgebase, General practitioners

### I. Introduction

Experts in the field of dermatology have classified disorders into 18 different categories, which are listed in Appendix - A. Moreover, within each category, the number of diseases varies from around 20 to more than 100 [1]. General practitioners and family physicians do not commonly see dermatological diseases [3]. However, they are the first to be contacted by the patients. To make a provisional diagnosis of dermatological diseases there is a need to have Decision Support System (DSS) for dermatological disease. Also, in dermatology, color is one of the parameter to describe the basic lesion [2]. If one can provide the required information on the fingertip, it will be extremely helpful to the physicians as well as the specialists in spot diagnosis. Analysis of color, along with the value of additional parameters of a disease, helps diagnosis of a disease. A model for the same is proposed here.

### II. The Model

The Fig. 1 presents a model of the Decision Support System (DSS) for diagnosis of a color spot in Dermatology.

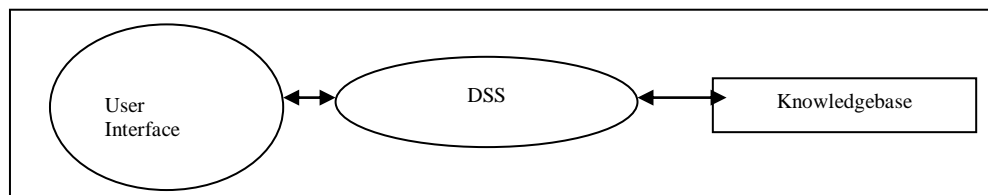


Fig. 1 The model of DSS for diagnosis of color spot in Dermatology

The model allows user to interact with the system. The user can be General practitioners, physicians, medical students or may be even dermatologist. Depending on the color of the spot, the system interacts with the user by asking several queries based on the symptoms and signs related to a set of diseases until the provisional diagnosis is made. The knowledgebase is designed to store information related to various diseases including disease name, basic lesion, probable time interval (e.g. after birth, since birth, since 5 years etc), size, shape and color of basic lesion, occupation of a person and most likely site for that disease along with symptoms and clinical signs. The design of this knowledgebase is described in Appendix - B. The Appendix - C shows the flow of the system. It shows how user interacts with the system and system leads towards provisional diagnosis for a color spot in dermatology.

### III. Applications and Usability

- This model of DSS can be used by family physicians and non-skin experts to diagnose a disease having spots of a particular color.
- It can act as a tutor to medical students.

### IV. Conclusion

In dermatology, main parameters for description of the basic lesions are number, size, surface, contour and color. The model presented here, considers a color parameter and other basic symptoms to diagnosis a color spot in dermatology.

There is further scope for developing models using other parameters, which may provide solutions for many challenging problems in dermatology. The system has been implemented using Visual Basic as front end and Microsoft Access as a backend tool.

### References

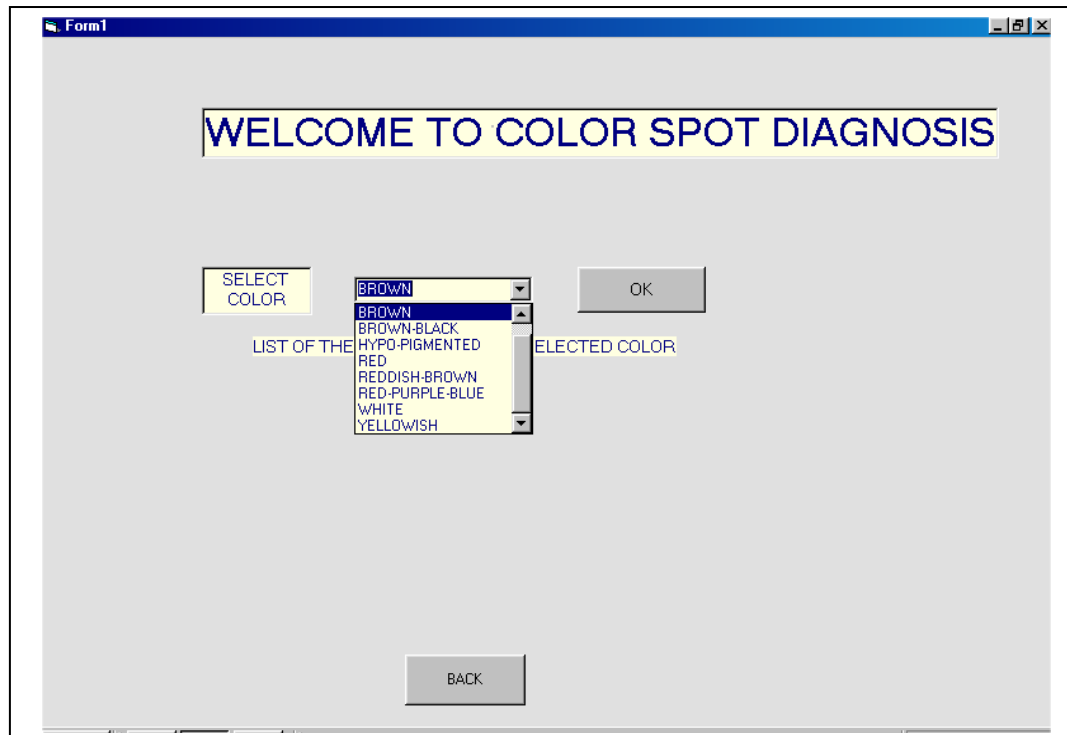
- [1] Park K., 'Text Book of preventive and Social Medicine', (Jabalpur, Banarasidas Bhanot),( 1999).
- [2] Khopkar Uday,'An illustrated Handbook of Skin and STDs with an update on HIV Infection', (Bhalani Book depot, Mumbai)(1999).
- [3] Deshpande S.G., Mehta V.R and Phatnani Pritam, 'A Colourful Atlas of Dermatology', (Excerpt medica, Hong Kong), (1992).
- [4] D. Christopher, 'Succesful Projects in Visual Basic', (BPB),(2000)

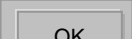
## APPENDIX – A TYPES OF DERMATOLOGICAL DISORDERS

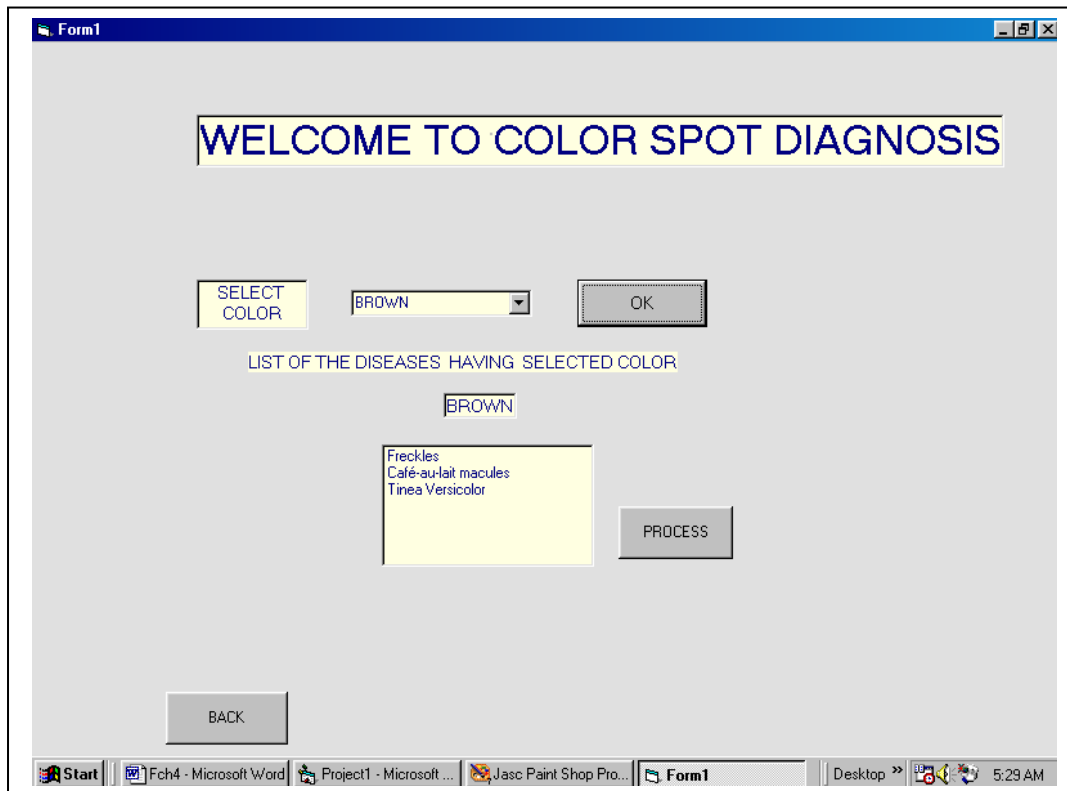
1. Acne and Acneiform Eruptions
2. Allergic Disorders and Drug Eruptions
3. Bacterial Infection
4. Connective Tissue Disorders
5. Erythematous, Papular and Squamous Disorders
6. Fungal Infections (Mycoses)
7. Genodermatoses
8. Hair Disorders
9. Leprosy
10. Malformations, Naevi and Tumors
11. Metabolic and Nutritional Disorders
12. Parasitic Infestations
13. Pigmentary Disorders
14. Sexually Transmitted Diseases
15. Tuberculosis of the Skin
16. Vesiculobullous Disorders
17. Viral Infections
18. Other than above listed

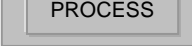
### Appendix – B

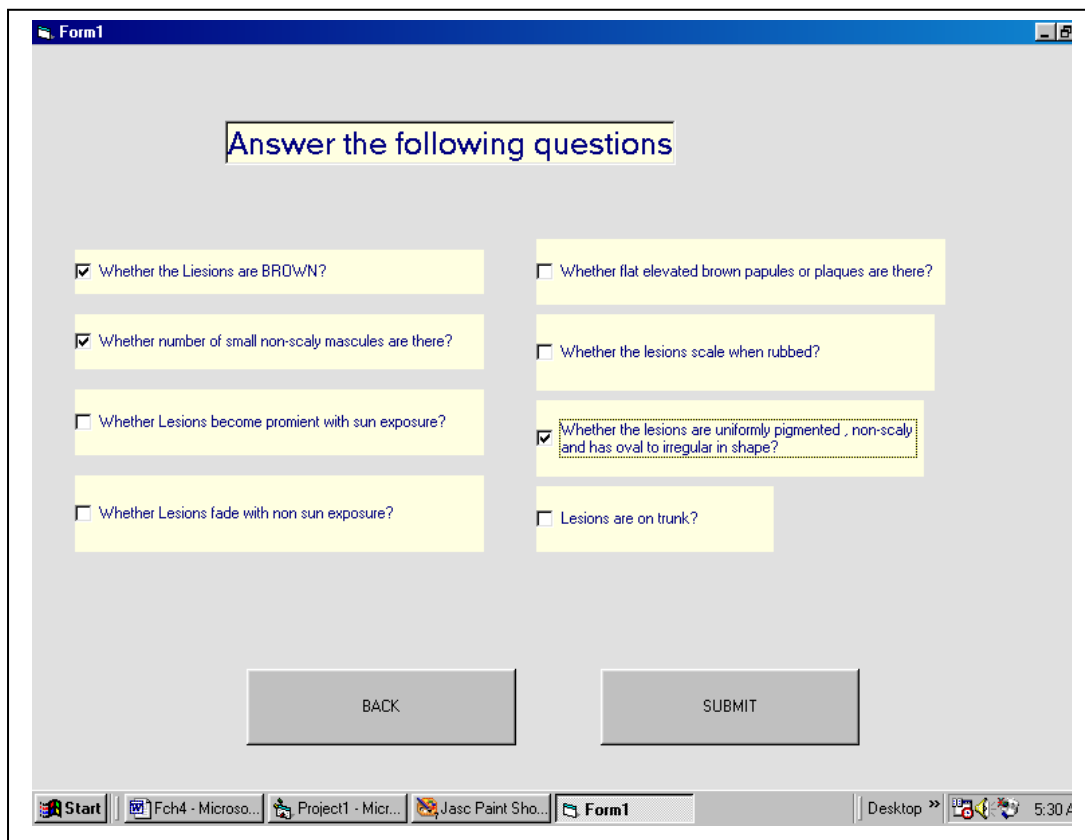
1. Select color of the spot from the DROP DOWN list of colors, say BROWN.

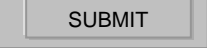


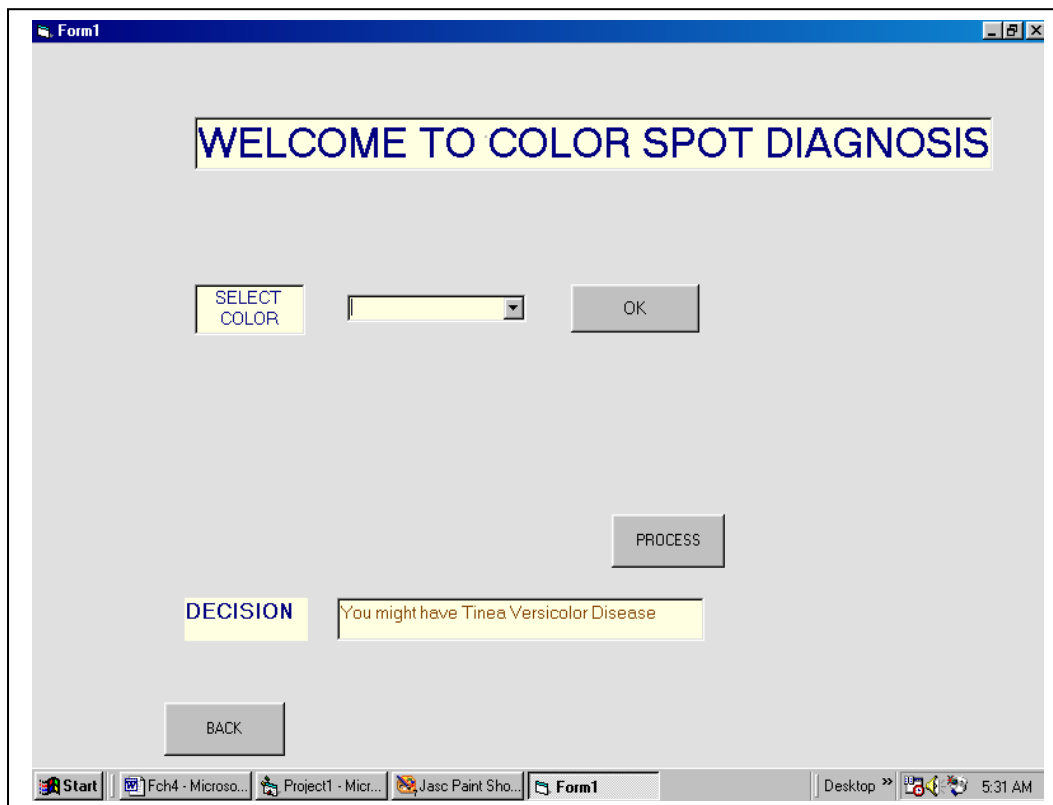
2. Select , this lists out the diseases name in which that color presents.



3. Now select  displays the form for answering different queries related to probable diseases. Answer the question, just by selecting the box. E.g. for BROWN color-spot it displays the following form to fill. Choose appropriate boxes for affirmative answer of the question.



4. Press  It gives probable diagnosis of brown color spot based on answer of the questions.



### DESIGN OF KNOWLEDGEBASE FOR DERMATOLOGICAL DISEASES

**Database Name:** SKIN

**Table Name:** DISEASE\_INFO

**Description:** Disease Information Master

**Function:** It stores the information about various diseases in detail.

FIELD NAME	Data Type	Size	Description
DISEASE_NAME*	TEXT	30	Disease Name
BASIC_LESION	TEXT	20	Basic lesion
AGE_DURATION	TEXT	20	Age
SIZE	TEXT	10	Size of lesion
SHAPE	TEXT	15	Shape of lesion
ULCER	YES/NO		Lesion is in ulcer form
CRUST	YES/NO		Lesion is in crust form
SITE	TEXT	20	Site of lesion
COLOR	TEXT	10	Color of lesion
PAIN	YES/NO		Lesion is painful
ITCHING	YES/NO		Itching is there or not
SPREAD	YES/NO		Lesion spreads or not.
APPE	TEXT	20	Appearance of lesion
BLEEDING_PUS	TEXT	1	Bleeding/ Pus
HAEMORPHAGIC	YES/NO		Lesion is Haemorrhagic
SWELLING	YES/NO		Swelling is there or not
LOSS_OF_SENSATION	YES/NO		Sensation is there or not.
WELL_DEFINED_BORDER	YES/NO		Lesion has well defined border is not.
SCLERA	YES/NO		
OCCUPATION	TEXT	20	Occupation of patient

\* **Key:** DISEASE\_NAME