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INTENT-DRIVEN DESIGN (DESIGNING AND DEVELOPING SOFTWARE'S BASED ON INTENTIONS OF USERS)

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Abstract :In Software Systems where different types of multiple activities can be performed by users (e.g. – ERP), it is generally seen that all the links are dumped on the home page. UI designers have to balance between number of links shown at any page Vs minimum number of clicks to reach any page from any other page.

If a novice user comes to access, it becomes difficult for him/her to understand the system. Training becomes crucial and probability of mistakes increases as the software is less than helpful if tried to use without guidance.

If a large scale Software System like discussed above, is designed based on 'Intentions' by which users can use them, it will become a lot of simpler and well-organized.

Introduction

Users visit or use the application or WebApp due to some 'Intention'. That intention makes the users to perform certain 'Activity' or a set of 'Activities'. That simply indicates that it is the 'Intention' that makes the users to perform 'Activities'.

That clearly indicates that user doesn't need links or notifications that are not related to his / her 'Intention'. Therefore, if we can group the activities that our WebApp or application can do into Intentions and show links of ONLY those activities which belong the 'Intention Selected By User'.

Thus, the entire idea is –

1. List down the Activities that your application or WebApp does.
2. Group them in Intentions
3. Give access of certain set of Intentions to Users based on requirements.
4. Request User to select the Intention behind his/her current visit
5. Show him/her links and notifications which belong to the selected Intention ONLY.
6. Enable user to change his/her selected Intention during one session to make it more user-friendly.

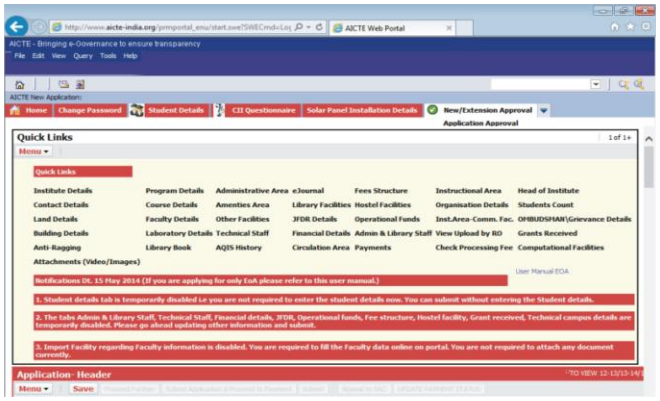
Problem Definition

This document focuses ONLY on Software System or WebApp(s) which offers multiple various types of actions.

Following are some of the main problems they face –

1. Crowding of links
2. Too many notification bars OR long list of notifications making one cycle very lengthy
3. Difficult to beautify the page
4. User needs to actually 'search' for links to his/her desired activity.

Following examples can describe the issues better –



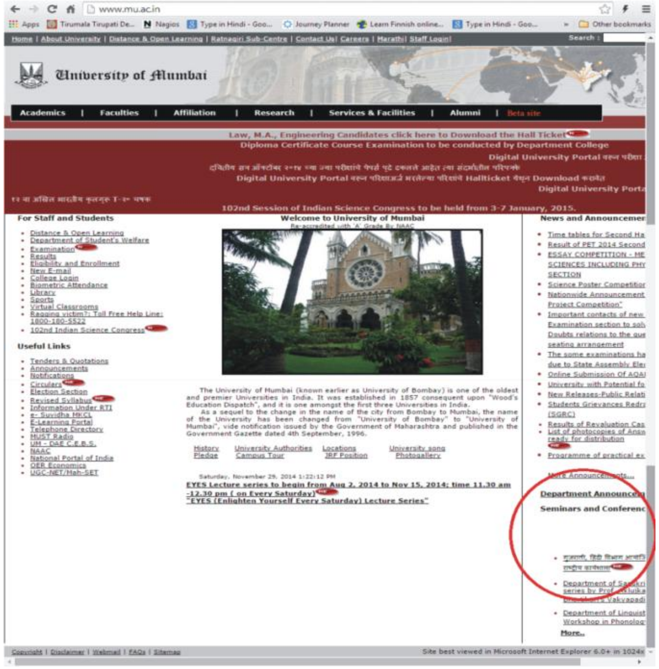
Notifications Dt. 15 May 2014 (If you are applying for only EoA please refer to this user manual.)

1. Student details tab is temporarily disabled i.e you are not required to enter the student details now. You can submit without entering the Student details.

2. The tabs Admin & Library Staff, Technical Staff, Financial details, JFDR, Operational funds, Fee structure, Hostel facility, Grant received, Technical campus details are temporarily disabled. Please go ahead updating other information and submit.

3. Import Facility regarding Faculty information is disabled. You are required to fill the Faculty data online on portal. You are not required to attach any document currently.

Figure 1. AICTE – Crowding of links


www.mu.ac.in
Apps
Tirumala Tirupati De...
Nagios
Type in Hindi - Goo...
Journey Planner
Learn Finnish online...
Type in Hindi - Goo...
Other bookmarks
Home | About University | Distance & Open Learning | Ratnagiri Sub-Centre | Contact Us | Careers | Marathi | Staff Login |
Search :
University of Mumbai
Academics | Faculties | Affiliation | Research | Services & Facilities | Alumni | Beta site
For Staff and Students
Distance & Open Learning
Department of Student's Welfare
Examination
Results
Eligibility and Enrollment
New E-mail
College Login
Biometric Attendance
Library
Sports
Virtual Classrooms
Ragging victim?: Toll Free Help Line: 1800-180-5522
102nd Indian Science Congress
Useful Links
Tenders & Quotations
Announcements
Notifications
Circulars
Election Section
Revised Syllabus
Information Under RTI
e- Suvidha MKCL
E-Learning Portal
Telephone Directory
MUST Radio
UM - DAE C.E.B.S.
NAAC
National Portal of India
OER Economics
UGC-NET/Mah-SET
Welcome to University of Mumbai
Re-accredited with 'A' Grade By NAAC
History
Pledge
University Authorities
Campus Tour
Locations
JRF Position
University song
Photogallery
News and Announcemen
Time tables for Second Ha
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Department of Sanskri series by Prof. Kulka Vakyapadi
Department of Linguist Workshop in Phonolog
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Law, M.A., Engineering Candidates click here to Download the Hall Ticket

Diploma Certificate Course Examination to be conducted by Department College

Digital University Portal

Digital University Portal Hallticket Download

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102nd Session of Indian Science Congress to be held from 3-7 January, 2015.

The University of Mumbai (known earlier as University of Bombay) is one of the oldest and premier Universities in India. It was established in 1857 consequent upon "Wood's Education Dispatch", and it is one amongst the first three Universities in India.

As a sequel to the change in the name of the city from Bombay to Mumbai, the name of the University has been changed from "University of Bombay" to "University of Mumbai", vide notification issued by the Government of Maharashtra and published in the Government Gazette dated 4th September, 1996.

Saturday, November 29, 2014 1:22:12 PM

EYES Lecture series to begin from Aug 2, 2014 to Nov 15, 2014; time 11.30 am -12.30 pm (on Every Saturday)
"EYES (Enlighten Yourself Every Saturday) Lecture Series"

Figure 2. University of Mumbai – Too many notifications

1. Crowding of links :
   a. You can see the number of links on one page in Fig. – 1.
   b. If you observe, these are just 'Quick Links'.
   c. The actual form is below the 'Quick Links' section and not visible here (See the size of scroll bar)

2. Too many notifications :
   a. You can see the number of notifications.
   b. There are two frames given for notifications, one with red background and another in bottom right corner (encircled).
   c. As the notification cycles progress the layout gets distorted.
   d. As the length of notification sentence varies with every notification, it becomes difficult in this kind of layout used in Fig. 2.

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Please Note : This document doesn't have any intention in pointing out the mistakes or bad design of the WebApps in Figure 1 and 2. These two WebApps do so many activities for their users, that they become good examples to demonstrate the difficulties faced by Web-Designers in balancing 'No. of Links on one page' Vs 'No. of mouse clicks to reach any page from any other page'

Solution

A. Introduction

Let us separate application into 'Activities'. User is using the application to perform some specific 'Activity' due to some 'Intention'. Thus –

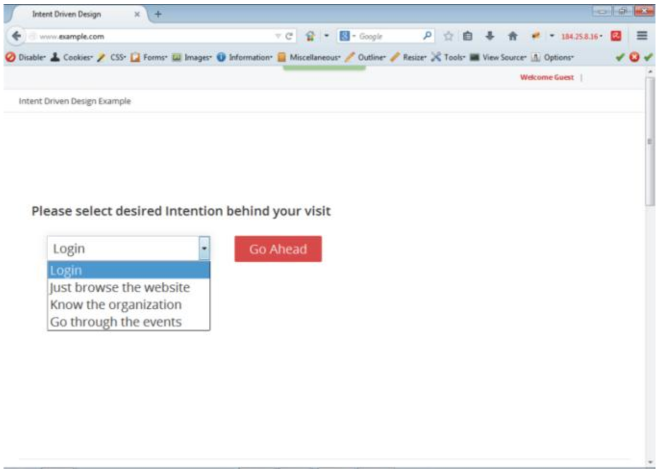
1. One 'Intention' can have one or more 'Activities'.
2. One 'User' can have one or more 'Allowed Intentions'

Let us consider we have two types of users for our Software Application. –

1. Guest (Who doesn't have login credentials)
2. Internal User (Who has login credentials)

Both types of users can have a set of 'allowed intentions' and user can be requested to select the appropriate one on the first screen.

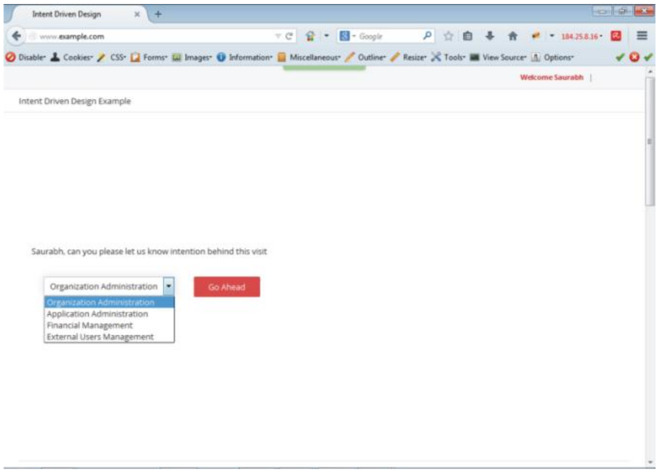
When user selects the desired intention only the links of activities that belong to the selected intention(s) will be shown. (Instead of dropdown list, Multiple Selection list can be used)



Please select desired Intention behind your visit

Login
Login
Just browse the website
Know the organization
Go through the events

Figure 3. Front Page for Guests

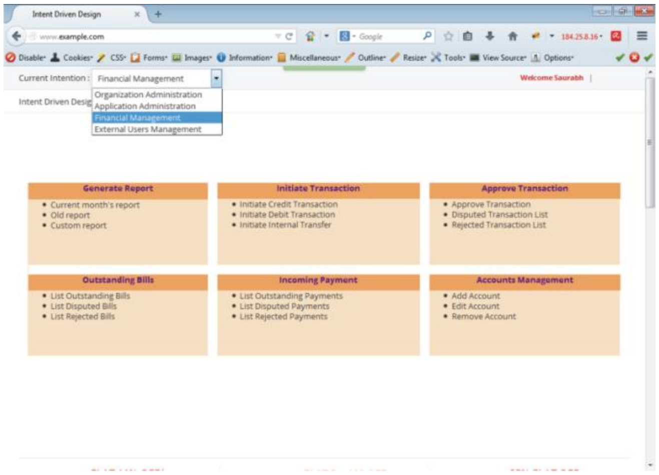


Saurabh, can you please let us know intention behind this visit

Organization Administration
Organization Administration
Application Administration
Financial Management
External Users Management

Figure 4. Front Page for Internal Users

Depending on selected Intention, user gets the links –


Intent Driven Design
www.example.com
Google
184.25.8.16
Disable Cookies CSS Forms Images Information Miscellaneous Outline Resize Tools View Source Options
Welcome Saurabh
Intent Driven Desig

Current Intention : Financial Management

- Organization Administration
- Application Administration
- Financial Management
- External Users Management

Generate Report

- Current month's report
- Old report
- Custom report

Initiate Transaction

- Initiate Credit Transaction
- Initiate Debit Transaction
- Initiate Internal Transfer

Approve Transaction

- Approve Transaction
- Disputed Transaction List
- Rejected Transaction List

Outstanding Bills

- List Outstanding Bills
- List Disputed Bills
- List Rejected Bills

Incoming Payment

- List Outstanding Payments
- List Disputed Payments
- List Rejected Payments

Accounts Management

- Add Account
- Edit Account
- Remove Account

Figure 5. Page with links for the selected Intention

The list of allowed intentions is always kept available at the page, so that the user can change the intention whenever required.

i.e. – After completion of desired activities, user should be able to change the 'current Intention' and get a different set of links for activities.

B. Implementation Idea

1. Participation from Application Side –
   a. Each UI component and Controller component associated MUST belong to one and ONLY one 'Activity'.
   b. An activity consists of FormUI, Controller and ResultUI.
   c. If multiple actions need be done, they MUST be called from one Controller component ONLY to keep the design simple. This restriction improves 'maintainability' of application.
   d. Each UI component and the Controller component MUST know the 'Activity ID' of the activity it belongs to.
   e. The AC (Access Controller) component shown will verify if logged-in-user has access to 'this' activity through the 'selected intention'

2. Database Participation
   a. Database contains the mapping of Users and Allowed Intentions.
   b. Database also has Intentions to Activities Mapping.
   c. All the selected intentions and selected activities by user will recorded for further use.
   d. This record can be used to –
      i. Show the intentions in dropdown list at first page in the descending order of historical selections by that user. So that most selected intention will be at the top of list.
      ii. Show the activities link on home page in descending order of historical selection by that user. So that most selected activity will be at the top left corner.
      iii. This kind of ordering will help most in case of mobile sites, where probability of need to scroll down can be reduced to minimum.
      iv. Selection of intentions or activities Vs age / location / post in hierarchy etc matrix can be derived.
      v. This type of matrix will help stakeholders to find out the area of focus.
      vi. This matrix will also help technical support team for resource mutualization.

Pros and Cons

A. Pros

1. Stakeholders can get the biggest Intentions behind users using the software application
2. Intention is the main reason behind use of software application, and stakeholders can get more hold on it
3. Development can be done Intention by intention
4. Some intention can have higher priority than other, and application maintenance and SLAs / OLAs can be decided based on Intention
5. Most used Intentions and most used links can get first position on screen. (Ordering and layout of Intention and links can be decided based on frequency of selection and use.)
6. Stakeholders can come to know the area of main focus (Instead of guessing the most used links, or calculating them based on logs or some third party site meters or site catalyst, stakeholders can get actual counts from users themselves.)
7. UI can be made simpler and more uncongested.
8. Having same UIs for Mobile, Computer etc can be made possible as UIs are simpler.
9. Instead of bombarding user with all types of notifications, only the notifications related to the selected Intention can be shown, which results into shorter notification cycles and lesser number of notification bars.
10. Stakeholders can get better view of variations of intentions with respect to age, geographic location, education etc.
11. In case of marketing / sales applications, this data can help a lot to the stakeholders as they can map a matrix

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of Intentions Vs Age, Intentions Vs Geographic Location etc.

12. Stakeholders can also get the duration wise variations in intentions. i.e. If some particular intention(s) are being selected at some particular time e.g. – Income Tax department will get maximum hits for 'Tax payment' at March end and 'Income Tax Returns' at September.
13. Once 'Intention Load Matrix' is obtained, hardware resources can be mutualized to get optimum results and 'noisy neighbor'[1] effect can be avoided.
14. Technical support team can derive the 'Number of complaints Vs Intention' matrix which can help stakeholders and technical team to focus at exact impact area.
15. If found that system is working fine, then it means that complaints are coming due to inappropriate or incomplete design or definition of that particular Intention.
16. As the Intent-Driven System grows old, it becomes more and more mature and the design itself will reduce the number of complaints over certain time period.
17. Even if the Intent-Driven system keeps on growing, it's past history will guide its future development.

B. Cons

1. Architecture may become delicate if intentions are not properly listed.
2. Design MUST be futuristic, otherwise application may fail or huge amount of rework will be required.
3. Weak design may lead to poor maintainability.
4. Stakeholders and System Architects MUST be clear about the system and potential users.
5. Stakeholders and technical team MUST keep on studying the matrix reports, otherwise the system will NOT achieve the smartness it is expected.

Conclusion

"Companies spending less than 13 percent of their ERP project costs on training are three times more likely to fall short of their business and project goals than organizations spending 17 percent or more"[2] In case of Intent-Driven Design, the cost of user training is much less as it also possesses the simplicity of common WebApp.

Even if this document is using WebApp(s) to describe the 'Intent-Driven Design' concept, this concept can also be used to design the desktop based applications. The only constraint in that case should be to collect the usage record from individual user machines to generate final intentions matrices for further evolution.

As the contribution of 'Cloud' [3] will increase, even desktop applications will also be continuously connected to their respective server which will make it easier to fetch the usage data and generate the matrices.

"Karma should be known. The cause by which karma comes into play should be known."[4] If system architects and stakeholders can design and develop the system based on possible intentions, the systems will be easier to understand for everybody (the stakeholders, architects, developers and most importantly the user).

Acknowledgments

I would like to take this as an opportunity to thank my wife as I was completely ignorant about publishing any idea. She introduced this 'research world' to me and encouraged me to work on this idea.

I would like to thank my parents, my family and my friends who tolerated my 'emotional absence in spite of physical presence' as I was completely busy working on my idea and always thinking about this ONLY.

I am thankful to IJACT Journal for the support to develop this document.

References

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[2] http://www.trainingmag.com/end-user-training-afterthought-or-key-erp-success

[3] http://en.wikipedia.org/wiki/Cloud_computing

[4] Nibbedhika Sutta by Gautam Buddha

Biography

SAURABH DHUPKAR received the B.E. degree in Computer Engineering from the University of Pune, City Pune, State Maharashtra, in 2008. Currently, He is working as Senior Consultant at Capgemini India Pvt. Ltd. His work area is more inclined in JAVA and Unix for application development and maintenance. He is beginner in the field of research and this is his first research paper. He may be reached at saurabh_dhupkar@yahoo.co.in