

Automated Functional Testing of Search Engine

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Outline

- Challenges in search engine testing
- Architecture of test automation for search engine
- 3 layer test framework for presentation tier
- Process necessary to support test automation
- Conclusion





Challenges in search engine testing

- What does a search engine do?
- Why is it difficult to test a search engine?

How to define expected results?

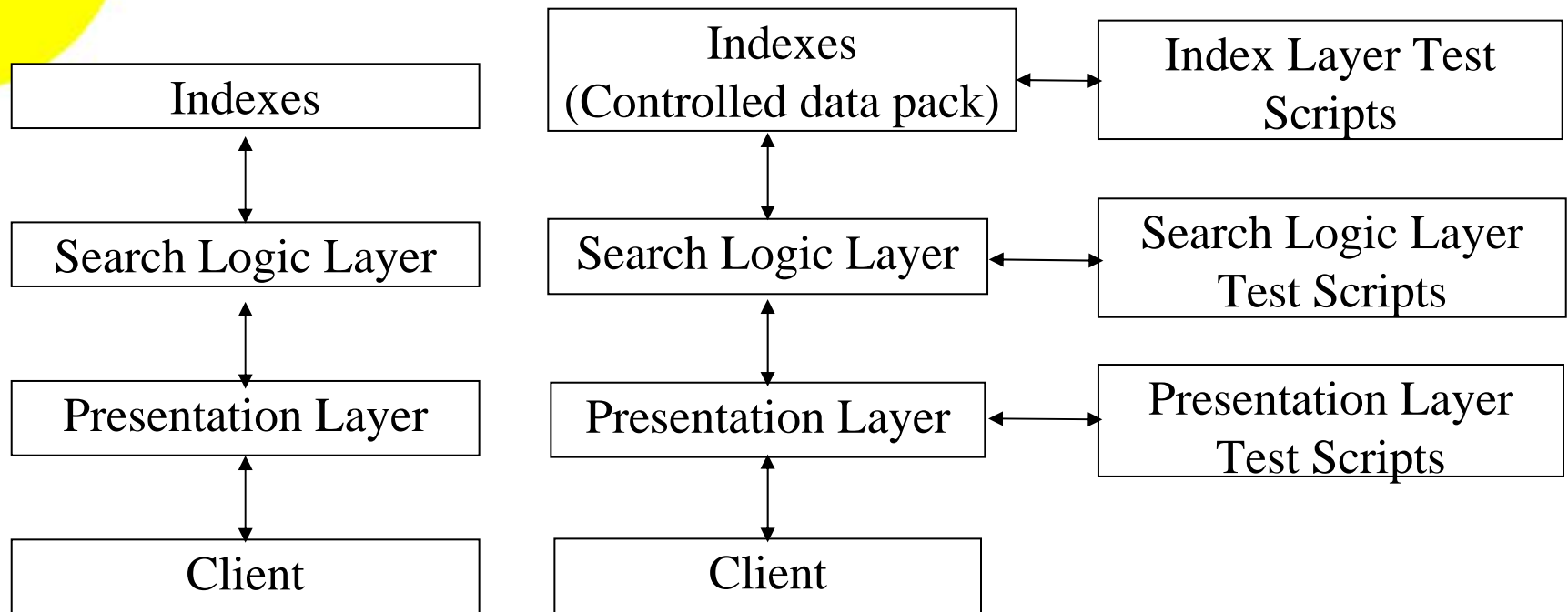
- Massive amount of data
- Complex search logic
- Ranking rules to control display order

Solution: a controlled datapack

- Some common issues with automated web functional testing and process



The architecture of test automation



(a) Search Engine

(b) Test structure

Fig.1 Architecture of search engine and test levels



Our test framework

Requirements

Robustness: All automated tests should be run unattended overnight as one batch from beginning to end without abnormal termination even when critical defects exist in software under test.

Maintainability: Scripts should be easy to maintain when update is required.



Layer 1: Object operations

```
Function ClickObject (Object, ErrInfo)
```

```
  With Object do
```

```
    If .Exist Then
```

```
      .Click
```

```
      ClickObject =0
```

```
    Else
```

```
      Reporter.ReportEvent (1, " object existence check" , ErrInfo)
```

```
      ClickObject =1
```

```
    End If
```

```
  End with
```

```
End Function
```

Specialize to:

```
Function clickSearchButton (BrowserPage)
```

```
  call ClickObject (BrowserPage.webButton("html id:=searchButton"),  
    "Search button not displayed" )
```

```
End Function
```



Layer 2: Test steps

a set of actions that form a state transition in the operation of the system

- Pre-condition, e.g. a certain window is displayed
- Setup Actions, e.g. enter data into editing fields, and/or select data from drop down lists or radio buttons.
- Transition Action: e.g. click a submit button

Example: 3 box search

Function threeBoxSearch (BrowserPage)

BrowserPage.sync

call setKeyword(...)

call setCN (...)

call setLocation (...)

call clickSearchButton (...)

End Function



Layer 3: test script layer

a sequence of function calls and check points

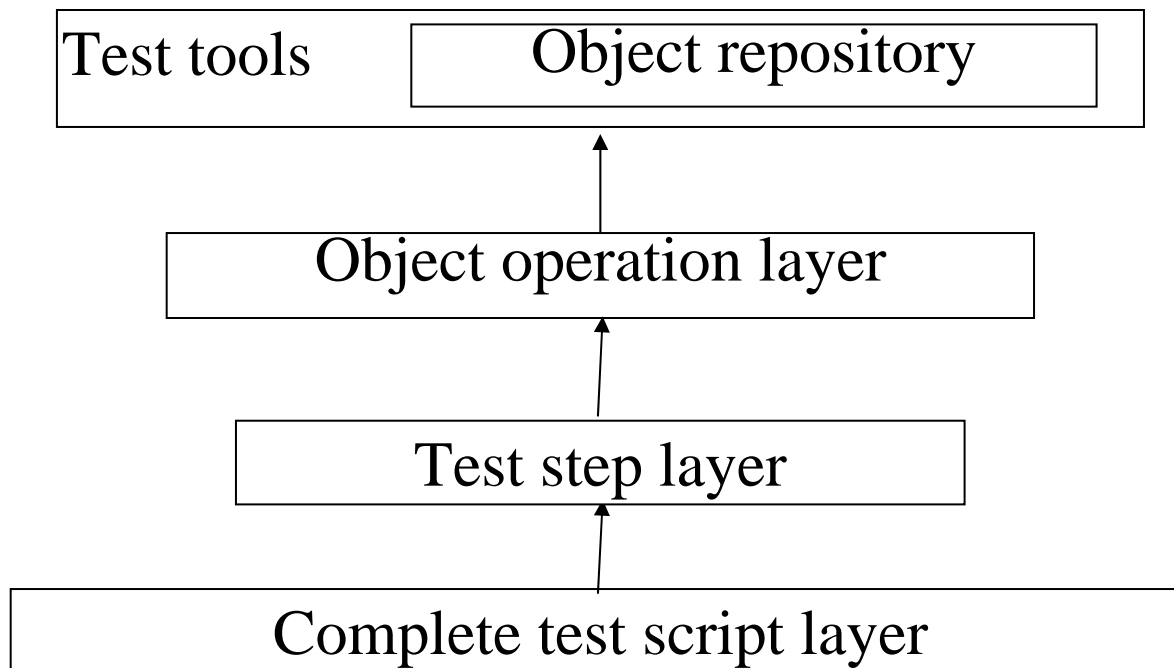


Fig. 2. A Layered Architecture of Test Scripts for Presentation Tier



Process we follow

- Identification of the initial regression pack
- Handover from projects or sprints/Live issues
- Review and reorganization to achieve long term value and less duplication
- Test maintenance
- Test environment and data maintenance

Evolved into 2 regression packs for presentation tier:
A generic pack and the full pack



Soft (managerial) side

- Communications to get support from management and various teams
- Keep statistics to show the benefits the business gets



Conclusion

- **Successfully implemented test automation and positive feedback**
- **Advantages of automated functional testing**
 - Faster test executions
 - Higher test accuracy
 - Better test accountability
 - Rigorously codified product knowledge

