



**Evaluation of an agile application  
development approach with 4GL tools  
in an offshored IT-Supply scenario**

Dr. Michael Linke



## Title & Abstract

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- **Title:** Evaluation of an agile application development approach with 4GL tools in an offshored IT-Supply scenario
- **Related research topics**
  - IT > Program Management
  - IT > Software Engineering
  - Social Sciences > Collaboration Mechanisms
- **Abstract**

The cost pressure for IT-organisations has grown considerably to deliver projects, software, capabilities and features faster and in a more cost-efficient way. Agile software development methods, like Scrum, in cooperation with tools and methods of (partly) automated code generation can be interpreted as an answer to these prevailing challenges. Within this evaluation study in a mixed SAP IT environment a conception for the combined usage of 4GL software tools and agile software development methods together with offshored software developers within different business domains was developed and therefore executed. The results showed that an average cost reduction between 40% and 80% regarding to the overall project setup were within the range of practical realization, if a decent project and communication governance would be in place.



## Agenda

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- Motivation and Introduction
- Agile software methods
- Communication and Collaboration as enablers
- CASE, 4GL and Code Generators
- Conclusion
- Literature
- Q&A

## Motivation and Introduction > As-is situation for IT organisations

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- The *cost pressure* for IT-organisations has grown considerably to deliver projects, software, capabilities and features faster and in a more cost-efficient way, and this not only since the financial crisis of the last years.
- Also the increasing spread of mobile applications for mobiles or smart phones – the number of them actually already exceeds the number of stationary personal computers [Westney1995] – as well as the associated importance of world-wide available “Apps”, contributes to the increased expectations of users on IT organisations.
- Together with an increasing *consumerization* of hardware [Hackenson2008], that is the use of business software on private end devices and vice versa, as well as a likewise increasing mixture of work and life habits, has led
- to a *21st century customer* [Takeuchi1986] who demands and asks for reactions to inquiries and requests, to some extent also real-time.

→ Demand for „fast“ and „cheap“ IT



## Motivation and Introduction > Dimensions

- Demand for „fast“ and „cheap“ IT
- Dimensions
  - Fast and efficient overall process (PM)
  - Fast and efficient software engineering itself (SE)



# Motivation and Introduction > Current market response SE



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Source.: [Windev, Scriptcase, Microsoft]

# Motivation and Introduction > Current market response PM

The collage features three overlapping web pages. The top page is Collabnet's homepage, advertising 'ScrumWorks Pro' as the best agile project management tool on the market for free, with a 'Download 10-user ScrumWorks Pro' button. The middle page is Telerik's homepage, featuring 'TeamPulse' and a 'SIGN UP FOR FREE' button. The bottom page is the PMI website, specifically the page for the 'PMI Agile Certified Practitioner (PMI-ACP) SM' certification, which includes a 'Ready to apply? Register and log in to get started.' button and text about the certification coming in the third quarter of 2011.

Source.: [Collabnet, Telerik, PMI]



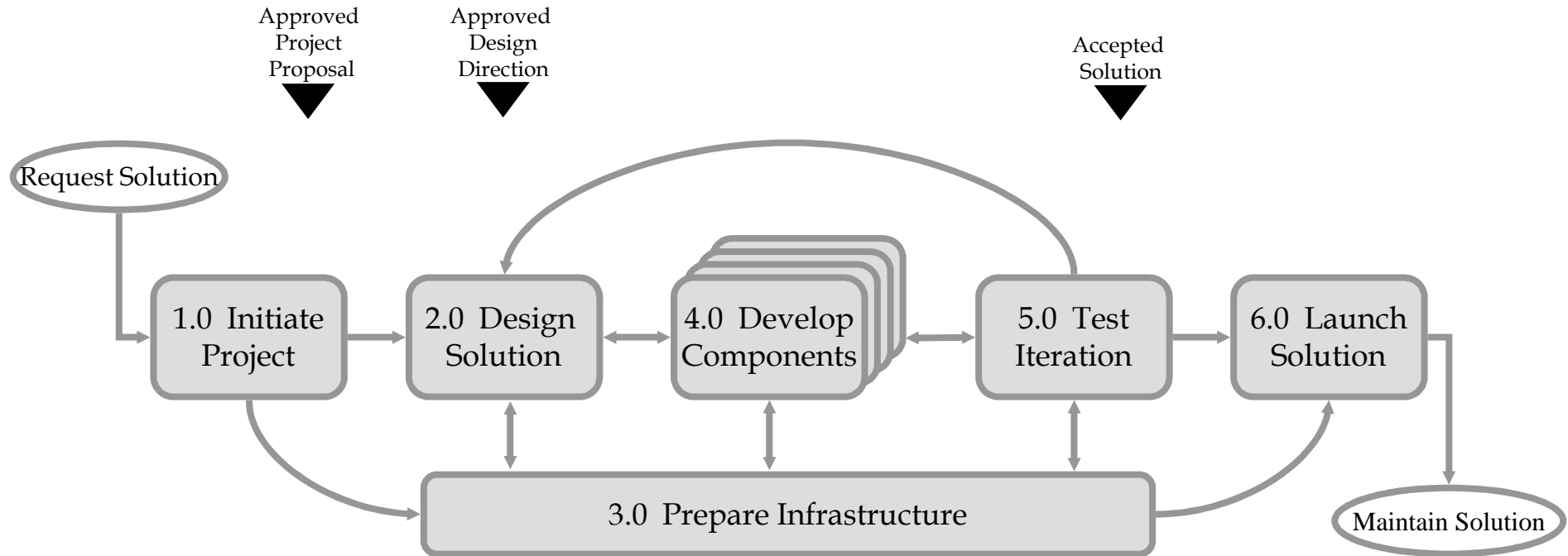
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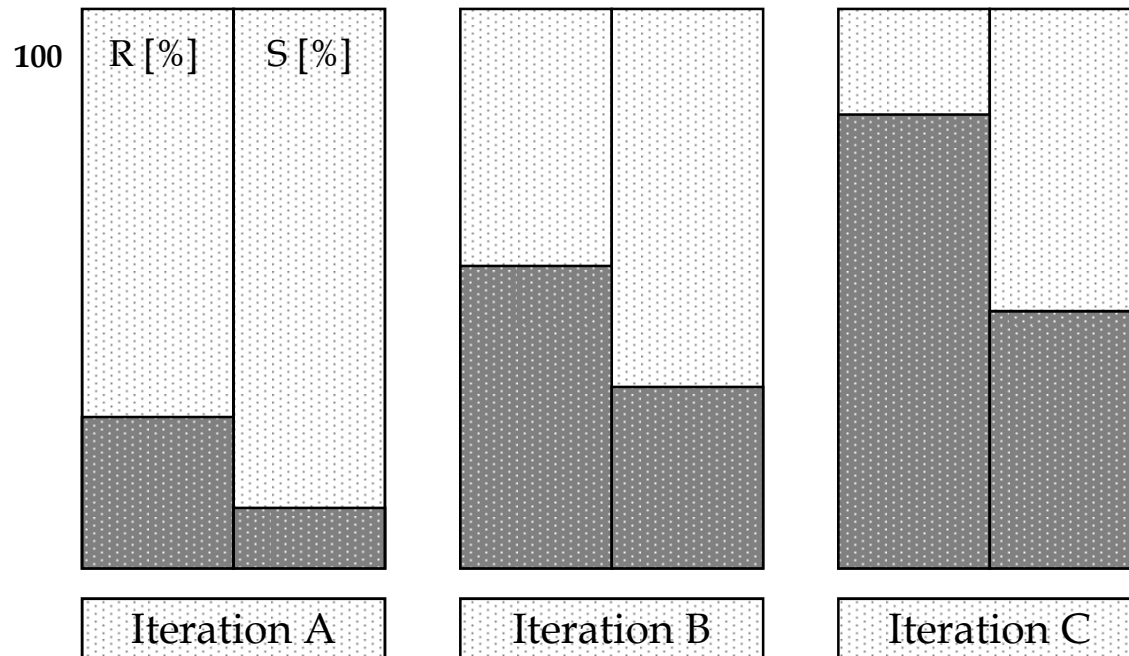


# Agile software methods > Overview of the process



Source: [Northeastern University, College of Engineering]

# Agile software methods > Incremental nature of agile methodologies



R = Requirement S = Software

Source: [Craig Larman, 2004]

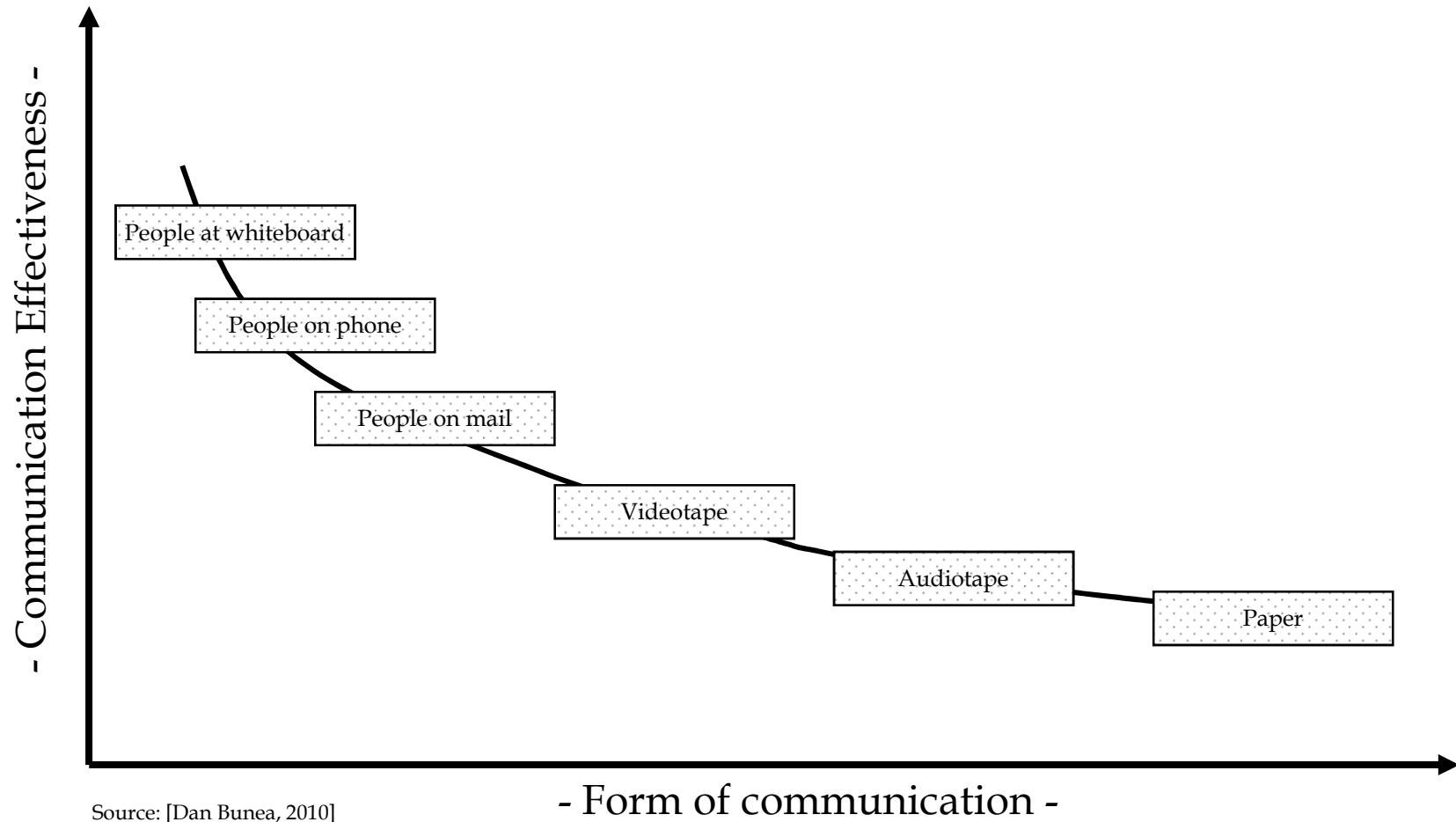


## Agenda

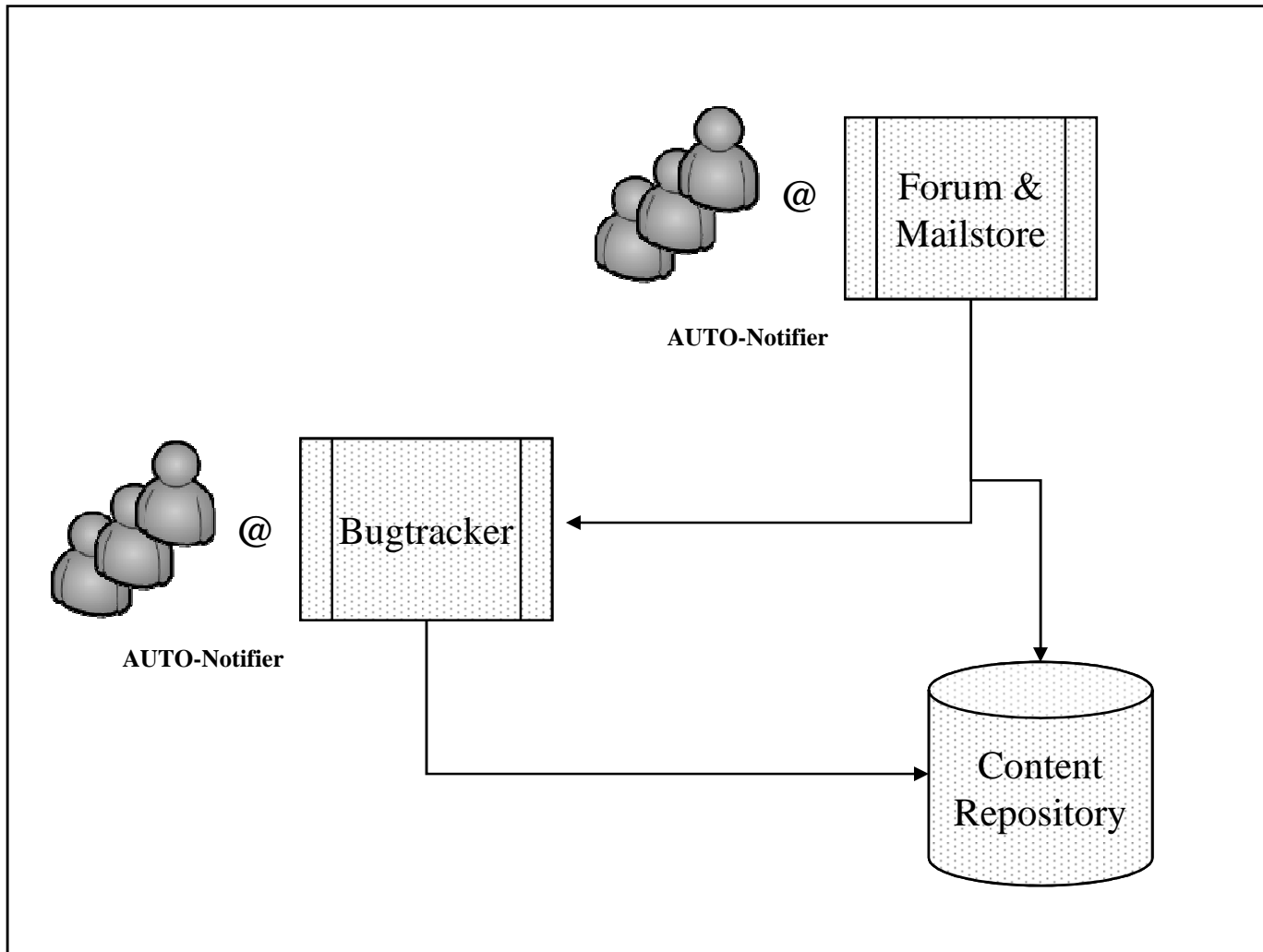
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# Communication and Collaboration as enablers > Effectiveness



# Communication and Collaboration as enablers > Technical setup



Source: [Own composition]

## Communication and Collaboration as enablers > Organisation setup

### New role of Technical Business Analyst in a „Hub & Spoke“ Architecture

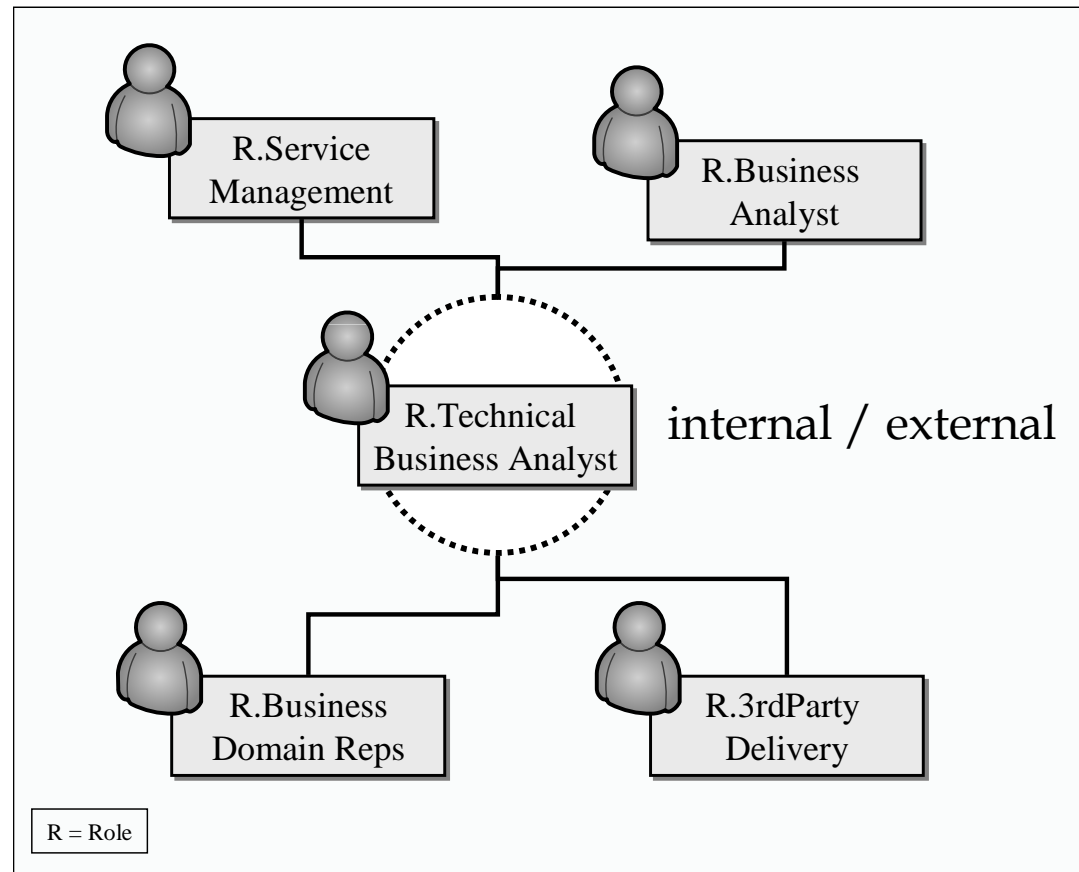


Fig.: Hub & Spoke roles of the Technical Business Analyst (Source: Own composition)

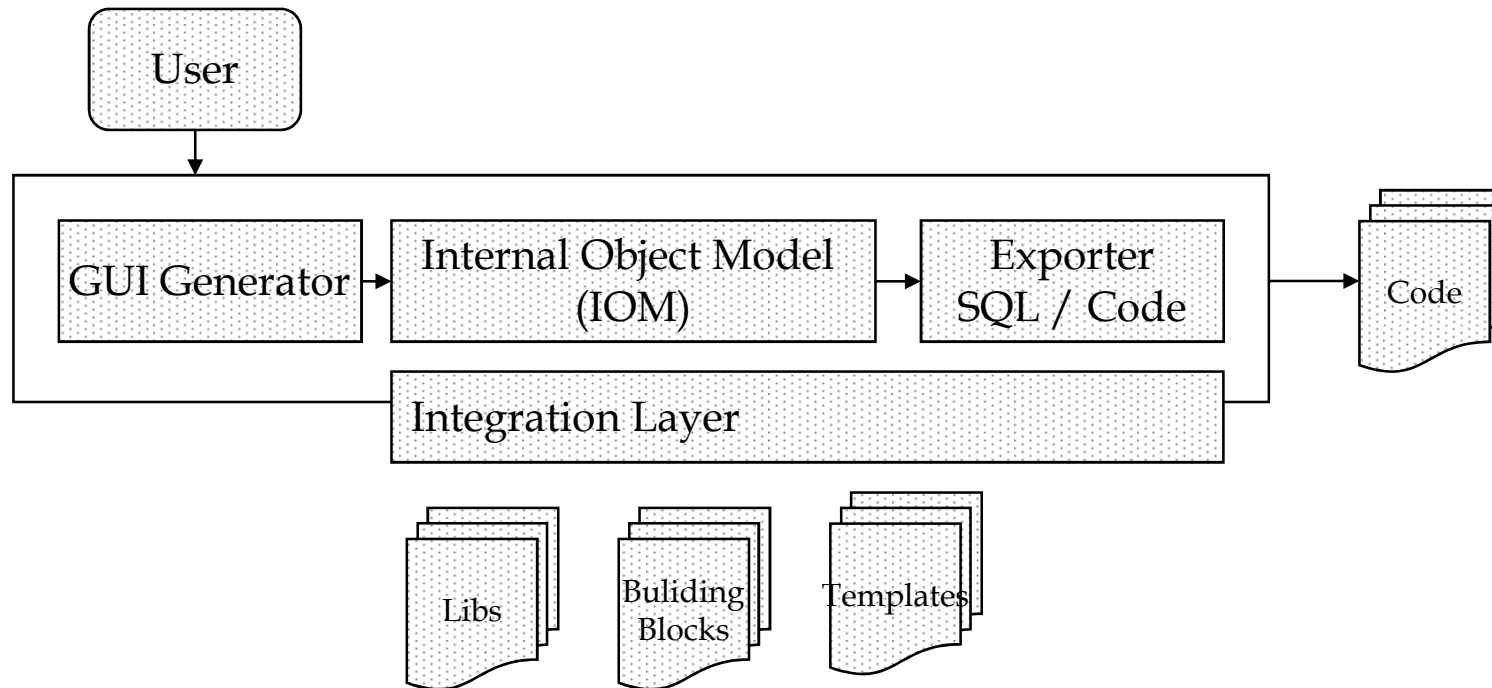


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# CASE, 4GL and Code Generators > Architecture view



Source: [Own composition]



# CASE, 4GL and Code Generators > Application view

**Product**

| Name                              | Type                     | Required                            |
|-----------------------------------|--------------------------|-------------------------------------|
| ProductID                         | Int32                    | <input checked="" type="checkbox"/> |
| ProductName                       | String                   | <input checked="" type="checkbox"/> |
| MSRP                              | Money                    | <input checked="" type="checkbox"/> |
| Description                       | String                   | <input type="checkbox"/>            |
| ProductImage                      | Image                    | <input type="checkbox"/>            |
| Category                          | String                   | <input type="checkbox"/>            |
| ProductRebates                    | ProductRebate Collection | <input type="checkbox"/>            |
| OrderDetails                      | OrderDetail Collection   | <input type="checkbox"/>            |
| CurrentPrice                      | Money                    | <input checked="" type="checkbox"/> |
| <a href="#">+Add Property&gt;</a> |                          |                                     |

**Data**

**Screens**

Select a screen template:

- New Data Screen
- Search Data Screen
- Details Screen
- Editable Grid Screen
- List and Details Screen

**Business Application**

Home | Save | Refresh | Data | Customize

Menu | Patient Maintenance | New Patient | Lookup Patients | CreateNewOrder | Product Info | Product List

Lookup Patients | Product List

Products | Search

Arranged By:

- Allergy Drops | \$15.99 | Maximum redness relief from pollen, ragwee
- PreserVision | \$34.50 | Patented formula with 10 mg of FloraGio Lu
- Moisture Eyes | \$12.89 | Soothes and comforts irritated, dry eyes
- Ocuvite® Plus | \$21.66 | Lutein Eye Health Vitamin

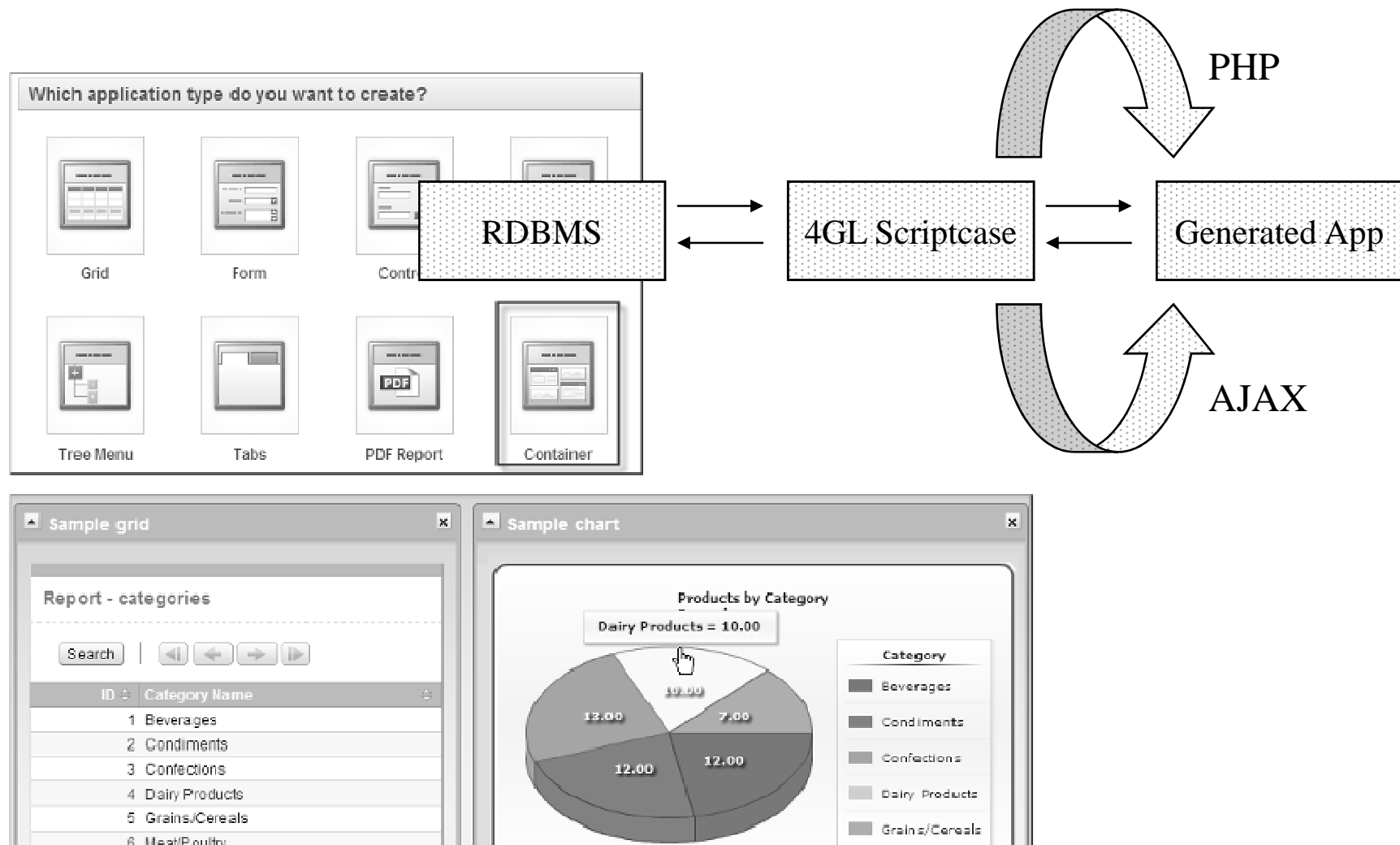
ProductID: 1 | ProductName: Allergy Drops | Category: Allergy | Description: Maximum redness relief fro | Image: [Image] | MSRP: \$15.99 | CurrentPrice: \$14.39

Product Rebates | Search

| Rebate Start | Rebate End | Reba   |
|--------------|------------|--------|
| 6/1/2009     | 12/31/2009 | \$4.00 |
| 3/1/2010     | 7/30/2010  | \$1.60 |
| 8/1/2010     | 8/31/2010  | \$5.00 |

Source: [Microsoft 2011]

# CASE, 4GL and Code Generators > Examined Tool “Scriptcase”



Source: [Scriptcase, 2011]

## CASE, 4GL and Code Generators > Historic dimension

| Period | Build    | Technology  |
|--------|----------|---|
| 1980's | 10-20 md | 3GL, T.P. Forms, Cobol, Codasyl Database.<br>Everything hard work ! |
| 1990's | 2-5 md   | 4GL, Case*Generators, Forms3, Oracle7/8.                            |
| >2000  | 3-6 md   | 3GL, Hand crafted Pl/Sql HTML, Oracle8.                             |

Source: [Foxopen.net]

Today



Microsoft  
Visual Studio LightSwitch

# CASE, 4GL and Code Generators > Current market outlook

## FeldThoughts



« Yahoo Finally Got Back Into My Daily Folder | Early Stage Investing in an Uncertain Economy »

### What Happened To The 4GL?

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On today, this day of endless blogging / talking (and hopefully downloading) of Google Chrome, I thought I'd go retro and write about my renewed hunt for the 4GL. But first, a little context on how this came about.

This summer I spent some time playing around with Google AppEngine to try and understand it better. It didn't take long before I realized I needed to really understand how to program in Python to do anything. So I spent some time reading about Python and ultimately realized that if I wanted to make any progress, I needed to spend a chunk of time actually learning Python. Fortunately, I found a nice MIT course titled

6.00. I took the equivalent (6.001) in 1999. I was a goody – I can re-live my 18-year old stu

I know that there are some companies working on this. In an attempt to be trendy, this is now called PaaS (Platform-as-a-Service). But it's really the reincarnation of the 4GL. And I'm not sure I really want a PaaS – I think I just want a 4GL that works with today's web-based environment.

Source: [Brad Feld]



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- Status Quo Open Source (OS) usage
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## Conclusion

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- With iterative software development methods it seems to be possible to develop software *faster* than with a development method driven by a traditional V-model.
- By using this general development approach with partly automated code generation, for instance through 4GL-code generators, additional *comparative speed and cost advantages* can be achieved.
- The use of *offshore developers* can be asserted as an additional component for IT-project cost reduction in IT-organisations, because usually they have significantly lower hourly rates compared to onsite developers.
- But at the same time the effort for communication between onsite and offsite resources *increased significantly*, here it was tried to support this at the best through the use of appropriate online collaboration tools.
- Despite the offshore components, iterative GUI reviews were possible through *telepresence* and web-conferencing though, as well as the processing of change requests.
- However, the historically observed shortcomings of the *code quality* of the 4GL-tools generation became as significant as potential topics concerning the guaranteed future of the operating company as well as the additional versioning of the development environment itself.

## Personal Recommendation

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... start small and smart ...



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