



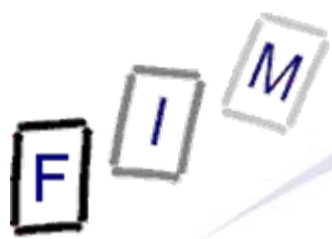
A small product line needing requisitely holistic management

Case study of a call-center application

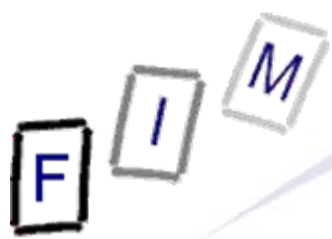
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Institute for Information Processing and
Microprocessor Technology (FIM)
Johannes Kepler University Linz, Austria

E-Mail: sonntag@fim.uni-linz.ac.at
<http://www.fim.uni-linz.ac.at/staff/sonntag.htm>



- What is a software product line?
- Why a product line here?
 - The special requirements of a call-center application
- Why holistic management?
 - Connecting product lines and holistic management
- Example: A call-center application
 - Brief presentation
- Legal protection of a product line
 - One aspect of holistic management in more detail



What is a software product line (SPL)?

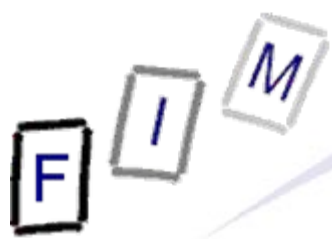
- Similar to industrial product lines
 - » This does not refer to the act of producing, but the products!
 - One-size-fits-all is no longer enough
 - » Example: Cars. Not only color, but many other details can be (and are) configured by customers as well
 - Individual products, but still very similar to each other
 - » But not just different configurations!
- For software this means:
 - Different versions with different (⇒not just configuration!) code
 - Simultaneously in "use" (sold, production, maintenance, ...)
 - Not just component reuse
 - » Components are used on lower levels, e.g. widgets
 - » SPL: Reuse of complete modules of business logic
 - No "general" reuse, but for a specific application area only



Why product lines need holistic management

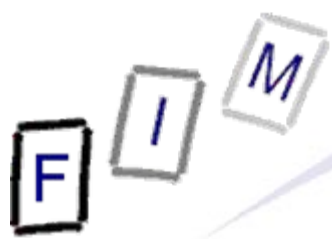
- Just a SPL alone is not enough:
 - Software (and its capabilities) influences processes too
 - » Both in the call-center and at the customer
 - Software shapes the offers: What can/cannot be done
 - » Decisions in the data model result in business and process implications!
 - Speed and quality of usage influences results
 - » Employee (dis-)satisfaction very important
 - You can hear it on the phone and then see it in the response rate!
 - Legal aspects
 - » What may be done (calling), how to protect data (privacy), ...
 - » "Second" usage of the SPL: Selling the SPL/incarnations

A holistic view considers and incorporates all these viewpoints, strongly improving the service to customers



The need for product lines in call-center applications

- Many different campaigns to call people/answer specific calls
 - Typically on very short notice (several days up to two weeks)
 - Require IT support for effective and efficient performance
 - Typically part of an external business process
 - » Data is received in a multitude of formats
 - » Results must be passed back again in various formats and ways
- Main problem: Desires of customers vary widely
 - Call, ask, fill in form ⇒ Extremely rare!
 - Prescribing a specific process to call/call again
 - When to send which results in which format where
 - How to process results, e.g. send physical/E-Mail serial letters
- Still, employees should use a similar application to reduce learning time and mistakes



Example: A call-center application

- Web application for handling in- and outbound calls
- Typical process as seen by call-center agents (OUT):
 1. Presenting base information for calling (name, phone)
 2. Calling and obtaining some information
 - » Alternative: Reschedule for later (busy, unreachable, ...)
 - » Alternative: Mark record as erroneous (e.g. wrong number)
 3. Save the record to the database and continue with next one
 - » Alternative: Send immediately by E-Mail
 - Depending on entered information (various rules)
 - X. Export information for "further processing"
- Other functions include:
 - » Statistics: Database as a whole, agents (time, success, ...)
 - » User management
 - » Data verification
 - » Messages to agents

Agent user interface example (old version)



TA Out: File Edit View Go Bookmarks Tools Help

http://www.msv.at/Telefonaktion_OUTbound.../main.php

MSV TA Out:

Telefonaktion-OUTBound: [redacted]

Geändert [Logout "Herr Michael Sonntag"](#)

ADRNR 051107_000001 Firmenname Geändert

FNR 157705 Strasse Postleitzahl Ort

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Akadem. Titel Position

Telefon:

Anmerkung:

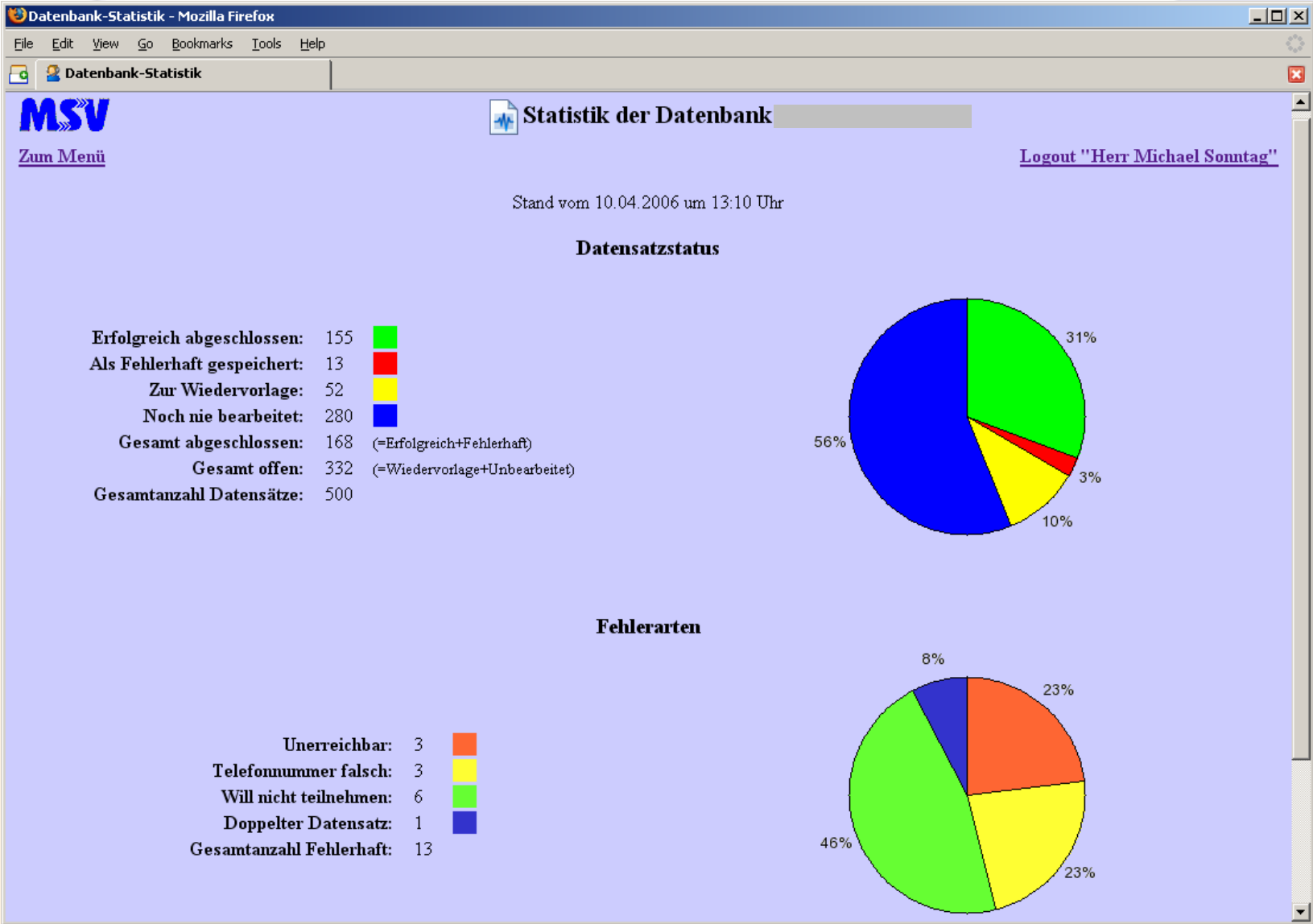
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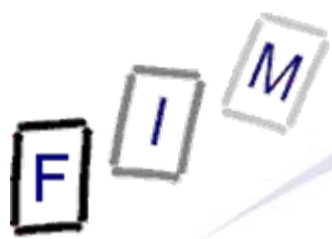
Database statistics (new version)





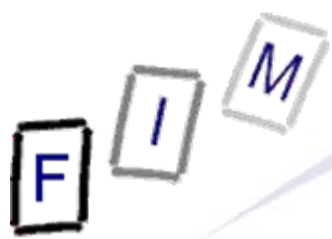
Example: Product line aspects

- Re-development impossible for each campaign
 - Modules for specific tasks are assembled and configured according to customer's desires; "glue code" for interoperability
- Module examples:
 - Agent registration: Often the name alone is enough (no PW!)
 - » Mass campaigns with dozens of agents
 - Timing: Checking the time needed for each record
 - ZIP code verification: Checking against official database
 - Various error conditions ("Not a company", etc.)
 - Work shifts: Number, timespan (calling also in the evening)
 - Exporting: Format, method (full, differential)
- Glue code: Physical layout of data fields (limited space)



Examples: Aspects of requisitely holistic management (1)

- Important viewpoints: Design
 - Example of what to ask first
 - » Business: Most important content
 - » Computer science: Identifying information (name, address,...)
 - » Legal: Willingness to participate
 - » Agent: Greeting and friendly introduction
 - » Called person: What is it all about
 - Especially missing: Customer (, public, TelCo, ...)
 - » Unless they prescribe it in detail, we provide full service
 - Reason: We are experts at this; they typically just want some results
- Modularizing for a product line
 - These must be business modules, not CS modules/objects
 - Still, CS is important: Data encapsulation and hiding
 - » Must be true for business modules also, or they are not reusable
 - Example: Auto-Dialing



Examples: Aspects of requisitely holistic management (2)

- Agent registration is nice from a security point of view, but...
 - Overhead increases: Agents are typically tested for some time before being accepted as permanent
 - Ensures correct spelling of names CS vs. Business
 - » Sometimes "fake" names are used (e.g. difficult to pronounce)
 - Permissions: Not everyone may do all ← Ignoring the callee perspective!
 - » Exporting records, statistics, ...
- Sending records by E-Mail
 - When, where, encryption, attachments, ... CS vs. Customer
 - Format of content (for process integration)
- Incorrect values
 - Really incorrect (strange phone numbers exist!)? Unknown?
 - Agent annoyance, called person dissatisfaction
 - Importance of field Agent vs. Customer vs. Callee

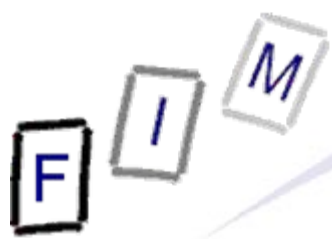


Legal protection of SPL

- The example is a web application
 - Could be "sold" over the web as service to other companies
 - » Customization done in-house for external customers
 - » Requires intimate knowledge of other call center and their own customers the application will be used for!
 - Or it could be licensed for customization there
 - » Web application: They actually receive the complete source!
- What can be sold depends on what is protected!
 - The individual application: ✓
 - A specific campaign (no code, only configuration): ???
 - The product line as such: ???
 - The idea of a web-based call-center application: ✗



- Programs are protected by copyright
 - This concerns the programming part of the webpages (PHP)
- But is HTML itself a programming language?
 - Probably not: No loops, decisions; only description of visuals
- Configurations (⇒important part of SPL!) are similar to HTML
 - They describe a specific "layout" of the program, but do not consist of statements, loops, ... themselves
 - » Really? Threshold values are similar to "if" in an abstract notation!
 - But: No direct relation to the end result!
 - See also: Visual GUI builders. They produce a configuration file, which is then "compiled" into source code
 - More complex configurations are therefore probably protected
 - Additionally: If accepted as "program", the creativity threshold is lower than for "normal" works, like pictures, texts, etc.
 - Configurations may therefore be changed under certain circumstances by the owner without consent of the author



Legal protection: Database protection, patents

- Database protection: Modules could be protected as a collection of individually accessible elements
 - But: No creative or special structure for organization ("heap")
 - No investment in selection, verification, or presentation of pre-existing elements ⇒ no plain database protection
 - » Investment in element (=module) creation (=programming) may **not** be counted for this type of protection!
- Patent protection for the SPL as a whole?
 - Basic idea: No. Ideas are not patentable
 - Separation into modules: No. Plans are not patentable
 - » In Europe; in the USA this might be possible!
 - Solutions to individual technical problems: OK!
 - » Example: Integration with PBX might be patentable
 - But: New, inventive,



- Product lines are applicable to small programs as well
 - They still must fulfill the general requirements for SPL!
- Because of their "mutability", product lines require a broader view on development, customization and configuration
 - Individually tailored to each situation ⇒ the **whole** situation must be taken into account!
 - » Software and process issues alone insufficient: Agents and customer processes need to be considered as well
 - » But not everywhere **every** viewpoint can or even **should** be considered!
 - Separation into modules very important: This may **NOT** be done according to technical (i.e. software) criteria
 - » These are **business** modules and also need other viewpoints!
 - » Interdependence of programming and business needs

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Questions?

Thank you for your attention!