

# The Babel Experiment

An Advanced Pantomime-based  
Training In OOA&OOD With UML

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# Agenda

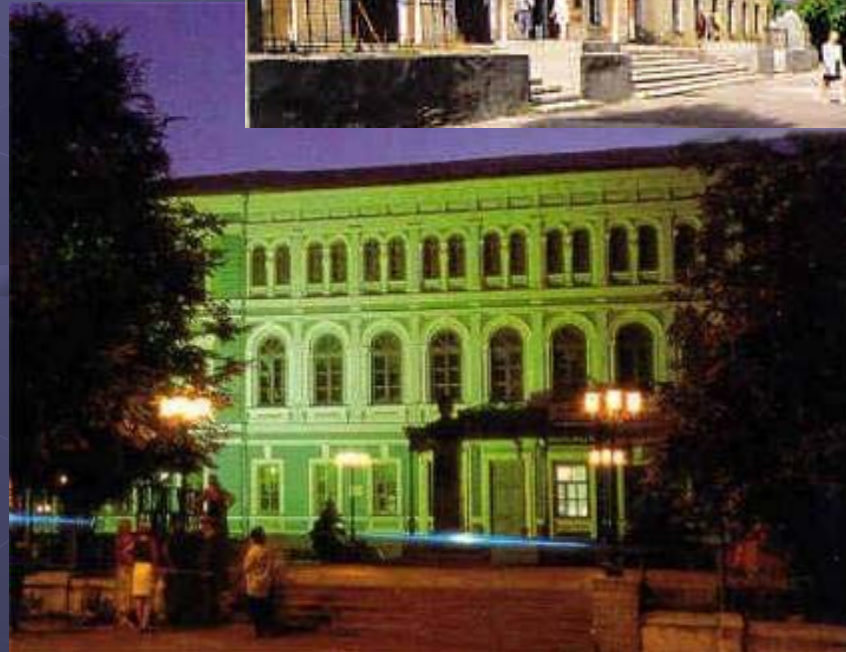
➔ ● Introduction

● Training Description

● Training Results

# University of Nizhniy Novgorod in 2004

- One of the top five Russian universities
- Over 1000 PhDs (professors, associated professors)
- Over 30000 students



# Intel in Russia in 2004



Nizhny Novgorod Site

- 13<sup>th</sup> year in Russia
- 1000+ engineers in R&D
- Russia/CIS HQ in Moscow
- Intel R&D centers in 5 cities: Moscow, St. Petersburg, Nizhniy Novgorod, Sarov, Novosibirsk

# The Babel Experiment: An Idea

- A team of students gets an assignment to create a high-level design for a software system
- They are required to use UML and are not allowed to use any other language (English, German, Russian, Ukrainian, etc), either spoken or written
- Students are given 4-6 hours to complete the task
- This assignment is always presented as an experiment – the students are to discover whether or not UML is “a real language” that can successfully serve as a communication tool within a team



# The Timeline

- 2001 – Vladimir L Pavlov had developed “The Babel Experiment”
- Since 2001 Vladimir has successfully delivered it more than ten times both in the software developing companies and universities
- The second author joined the first in June, 2004, and they had developed a TTT (Train The Trainer) course for the Babel Experiment
- The first TTT was conducted at the second half of 2004
- In March 2005 there will be the first delivery of the Babel Experiment by an attendee of our TTT

# How To Teach UML?

- We do not teach UML – we teach modeling
  - Design patterns are important
  - UML Metamodel is a great example of good design
  - Do not forget about OCL

● Practice

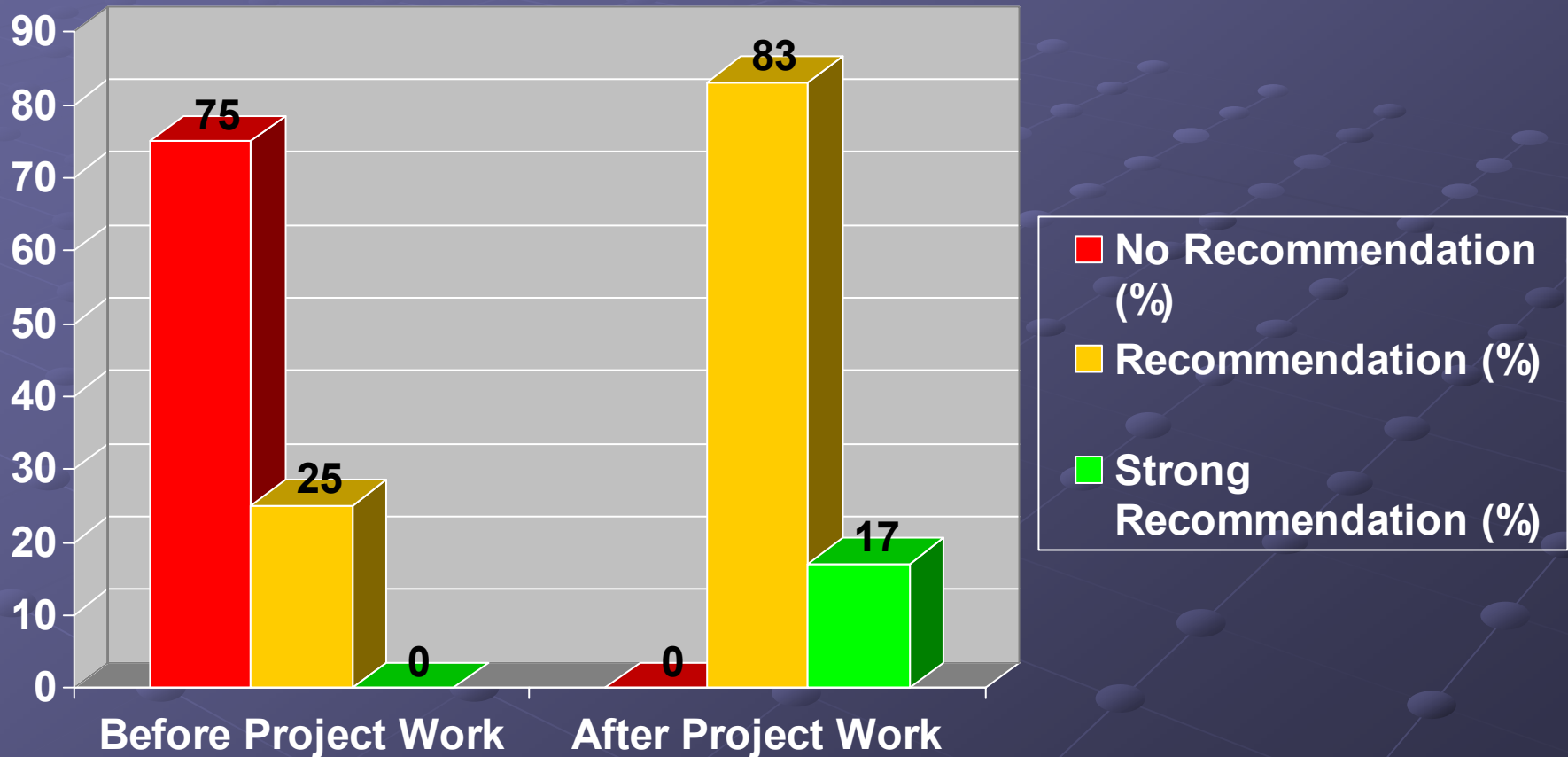
● Practice

● Practice

● Practice...

# Dirk Frosch-Wilke's Research

After participation in a practical project, students realize the expediency of using UML



Recommendation of using the UML for software requirement analysis given by students before and after project work

# So, The Problem Is...

- If we want to make students taste all the benefits of OOA/OOD and UML, we need to give them a chance to participate in a really large software development project
- It is quite hard to incorporate such project into university curricula

# The Goal

- To have a training which will allow students to:
  - go through the communication problems that are typical for large software development projects
  - obtain the successful experience of applying OOA/OOD and UML to overcome these problems

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# The Babel Experiment

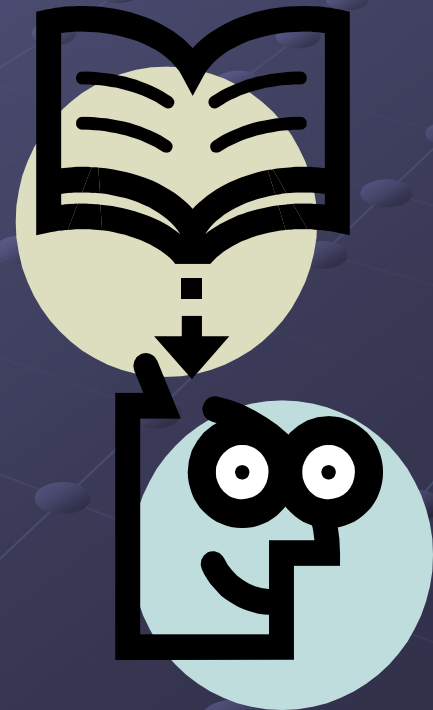
## ● Very intensive training

- unusual conditions of this experiment allow students to get the teamwork experience similar to what they could learn from a “real” project that would last several weeks
- “joint eating a peck of salt in the compressed time/space”

## ● Is based on...

- The Charades game
- A legend about the Tower of Babel

## ● A challenge for students

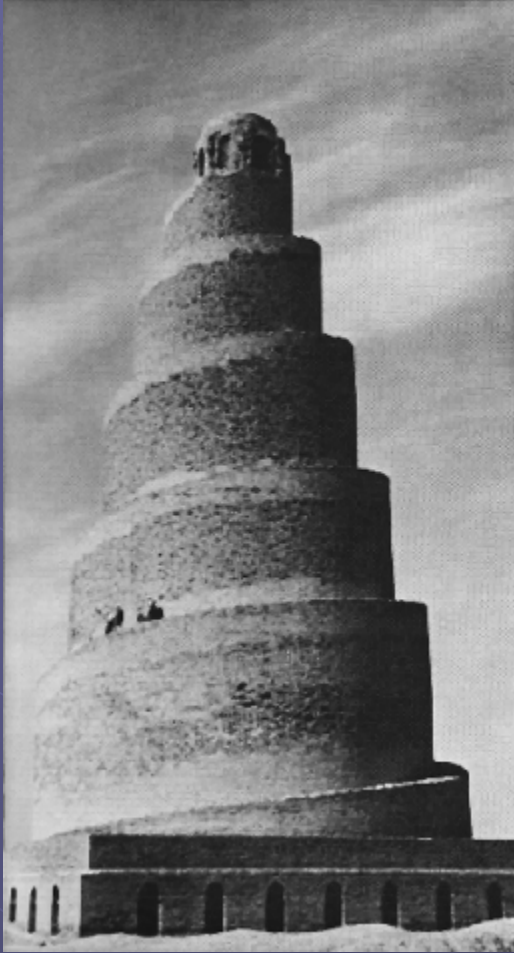


# The Charades Game

- There are two teams (each from 3 to 10 members)
- Members of the first team secretly agree on a word and then they tell this word to only one person from the second team. The chosen person has to pantomime the proposed word to members of his(her) team, and they have to guess the word. (S)he can not use speech or writing
- Teams exchange their roles as soon as the word is guessed correctly or the second team gives up. Team, which has guessed the word, proposes new word and the other tries to guess, and so on
- Examples: melioration, placebo, expansion, encapsulation...



# The Tower Of Babel



- This legend shows that without having a common language human beings are incapable to achieve the common goal

# Genesis 11

- Now the whole earth had one language and few words. And as men migrated from the east, they found a plain in the land of Shinar and settled there. And they said to one another, "Come, let us make bricks, and burn them thoroughly." And they had brick for stone, and bitumen for mortar. Then they said, "Come, let us build ourselves a city, and a tower with its top in the heavens, and let us make a name for ourselves, lest we be scattered abroad upon the face of the whole Earth."
- And the Lord came down to see the city and the tower, which the sons of men had built. And the Lord said, "Behold, they are one people, and they have all one language; and this is only the beginning of what they will do; and nothing that they propose to do will now be impossible for them. Come, let us go down, and there confuse their language, that they may not understand one another's speech."
- So the Lord scattered them abroad from there over the face of the Earth, and they left off building the city. Therefore its name was called Babel, because there the Lord confused the language of all the Earth; and from there the Lord scattered them abroad over the face of the Earth.

# The Babel Experiment

- Students check whether UML is “a real language”
- It is important that students recognize it as a challenge
- **“if you pledge, don’t hedge”** mindset
  - To insure that students feel their responsibility for the Experiment results, we always invite a lot of guests/spectators to the presentation, which is the culmination of the event
  - After the presentation the guests discuss the developed model and they make a decision whether the team has managed to solve their task



# Approximate Schedule

Day	Activity
1	The event is announced to students
1-16	● Students prepare for the exam ● Intensive Charades training
8-16	Spectators receive invitations
17	The exam
18	<b>The Babel Experiment</b>

# The Team Of The Experiment Participants



- Excellent knowledge of OOA/OOD and UML
- 8-10 persons
- Males and females
- Extraverts and introverts
- Close ages

# Participants Selection

- Competition is important
  - We usually select 8-10 students out of 20-30
- Verbal exam
  - Open questions
- As an alternative to viva voce examination we have always suggested students to earn industry recognized certifications on UML
  - IBM 486 Object-Oriented Analysis and Design with UML
  - OMG Certified UML Professional

# Roles And Responsibilities

## ● Participants

- design the model without using speech
- present the experiment results to spectators

## ● Trainer

- prepares the experiment task for participants
- makes sure the training participants follow the Experiment rules
- is not involved into the process of designing a system
- looks after the process and later gives the feedback to participants

## ● Trainer assistant

- supports logistics, organizes lunch and connection with “the outside world”
- meets and manages the spectators
- responsible for insuring that all Experiment participants strictly follow the rules

## ● Spectators (guests)

- attend the presentation
- provide feedback to make the final decision whether the experiment was successful or not (whether it “proves” UML to be a “real language”)

# Strike The Four Matches



1. The event starts

- Instruction of the participants



2. Switch to “speechless” mode

- Team opens an envelope with the task
- Team works on the task
- Light “speechless” lunch
- Team moves to the presentation room



3. Presentation starts, speech is allowed

- Presentation
- Postmortem



4. The event ends

# Approximate Timing

- 10:00 – the strike of the first match, the event starts
    - 10:30 – the strike of the second match, switch to the “speechless” mode
    - 14:00 – easy lunch, speech is not allowed
  - 15:00 – the strike of the third match, switch to aloud mode, presentation starts
    - 15:30 – presentation ends, the discussion with the spectators starts
  - 17:00 – spectators leave the auditorium
    - postmortem with participants starts
  - 18:00 – the strike of the forth match, the event ends
- 
- We usially organized the Babel Experiment on a weekend, so that more spectators (guests) could attend the presentation
    - Sunday seems to be the best option



# An Assignment

- An assignment consists of two components (parts): one component is unique and is created for each Experiment; the other component is the same in all Experiments that are conducted
- Sample assignment is provided in our article – see the Proceedings of the 36<sup>th</sup> SIGCSE, pages 231-235
  - Available for download from:
  - [http://www.vlpavlov.com/ooaood/articles\\_en.html](http://www.vlpavlov.com/ooaood/articles_en.html)
  - <http://portal.acm.org/citation.cfm?id=1047124.1047426>

# Postmortem

- ❶ What is the main result of the experiment?
- ❷ What went right?
- ❸ What went wrong?
- ❹ What was a surprise?
- ❺ Was any information lost or misinterpreted? Why?
- ❻ Lessons learnt
- ❼ **Thank you to each other!**



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# Results

## ● The Experiment Results

- The Babel Experiment was conducted more than ten times since it had been invented
- It had never failed

## ● The Training Results

- The training was successfully delivered in both academic and corporate environments
- It generated positive feedback from students and customers

# Feedback From Students

- ...this experience of practical UML-using forced me to change my attitude with regard to UML – now I do understand how it could help me in real-life projects...
- ...participating in the Experiment helped me to realize that UML is not a kind of abstract “Glass Bead Game”, but rather a very practical tool...
- ...thanks to the Experiment I was able to understand that usage of different UML diagrams (class diagram, sequence diagram, use-case diagram, etc.) really makes sense when they all are used together, representing different points of view for the modeled system...

# Feedback From The Invited Guests/Spectators

- ...The Babel Experiment was an interesting exercise. The model developed shows how precise and unambiguous UML can be if properly used. I would definitely repeat this kind of training for all UML learners who want to get a feeling of what UML can really give to the team...
  - *Sergiy Alpayev (Chief Software Architect, ISD, Ukraine) about the Babel Experiment which was organized in April 2001 in Dnipropetrovsk, Ukraine*
- ...The Experiment participants have developed the model which was solid, polished, and contained several very bright ideas...
  - *professor Viktor Gergel (CS dept., UNN, Russia) about the Babel Experiment which was organized in August 2004 in Nizhniy Novgorod, Russia*

# Project “Virtuoso”

- Every year 15-30 best young teachers/professors from FSU universities come to Nizhniy Novgorod for 6 months
  - August-December
- They attend the best in the world courses on software engineering
  - Courses are provided by Intel, Microsoft, IBM, Borland, Kaspersky Lab, Carnegie Mellon University and other project co-sponsors
- They get real-life experience at Intel Russia
  - They spend about 50% of their time in real Intel projects
- Once the program is over, they **must** return to their universities and continue to teach there
  - They must teach there for at least 2 years
  - This is our contribution to fighting digital divide and solving local brain-drain problem
- The project is initiated and driven by Intel, and it is supported by many world-known high-tech companies
  - <http://www.curricula.ru/virtuoso>

# Train The Trainer

- In 2004 we have conducted the first TTT on The Babel Experiment
- The TTT was delivered to the participants of the project Virtuoso
- On this TTT we had 2 teams working independently on the same task...

# Two Teams Working On The Same Task

- One team was limited to using only the UML language and the pantomime in their communication
- The other was allowed to use the speech in addition to the UML
- The first team (which was not allowed to use speech) coped with a task more successfully than the other team
  - Their diagrams were more detailed, more elaborated and elegant

# What Are The Areas For Further Research?

- How can we change the Babel Experiment in order to make it more efficient knowledge delivery tool?
- Can we use pantomime-based approach to teach other languages (not only UML)?
- Can we combine the pantomime-based approach with other innovative teaching techniques?
- Can we use pantomime-based approach to assess and compare usability of various software packages?
  - Several competitive teams working independently on the same assignment but using different software tools?
- You are welcome to join us in our exploration of the pantomime-based area

# Few Words About Statistics

- The precise statistics is not available yet
  - Till now, all the Babel Experiments were conducted only by Vladimir L Pavlov, so, what does the current statistics measure – the Experiment or Vladimir ? ;-))
- In 2004 we have developed and started to deliver the TTT, so many trainers will conduct their Babel Experiments soon
- We have developed the unified questionnaire to be used by every trainer who conducts the Experiment
- In 2 years we are going to collect an exhaustive statistics
- Your help is welcome!

# Welcome To Canada !

- The 18th Conference on Software Engineering Education and Training (CSEE&T)
- April 18-20, 2005, Ottawa (Canada)
- <http://www.site.uottawa.ca/cseet2005/>
- The presentation **“Using Pantomime in Teaching OOA & OOD with UML”** (by Vladimir L Pavlov and Anton Yatsenko) will provide more details about the Babel Experiment

# Our thanks to:

- Alex Zverintsev (Nokia, Poland)
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- Michael Wrinn (Intel, US)
- Nikita Boyko (Dnepropetrovsk National University, Ukraine)
- Nikolay Mitushin (Intel, Russia)
- Stanislav Busygin (University of Florida, US)
- Yury Bushenko (University of Westminster, UK)

# Summary

- **The Babel Experiment is a pantomime-based training**
  - The declared goal to check “Whether UML is a real language”
  - The results of such experiments were always positive
- **The Babel Experiment is effective**
  - The experimental nature of this method inspires students to study OOA/OOD and UML really deeply
  - The practical nature of this method helps them to recognize OOA/OOD with UML as a practical tool rather than a theoretical method
  - After attending the experiment students report that they are eager to apply UML in their real-life projects
- **The training was successfully implemented in both academic and corporate environments**
- **The training evolves over time**
  - You are welcome to use it
  - You are welcome to contribute to the development of the pantomime-based approach
  - Contact the authors for details

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