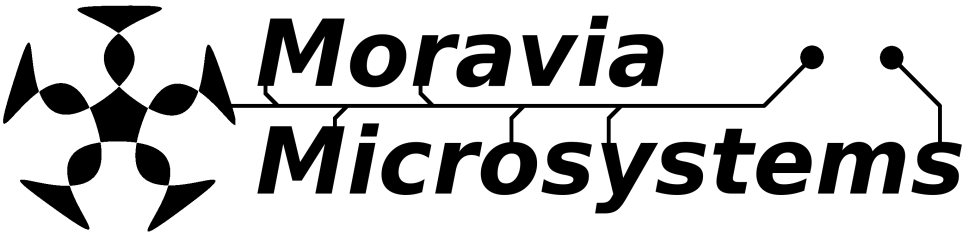


Figure 1: *Suggested logo of the company.*

Business plan

Comprehensive development tools for computerized hardware.

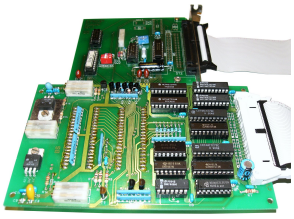
Martin Ošmera, Brno, 2012

Contents

Chapter 1

Preface

1.1 Prologue



Look around you, computers and networks are everywhere, enabling an intricate web of complex human activities: education, commerce, entertainment, research, manufacturing, health management, human communication, even war. Of the two main technological underpinnings of this amazing proliferation, one is obvious: the breathtaking pace with which advances in microelectronics and chip design have been bringing us faster and faster hardware.

Microcontrollers are one of the most interesting electronic devices of all, basically they are small computers integrated on a single chip, along with their memory, and other circuits, all of it packed into a single electronic device. These little computers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input/output devices, microcontrollers make it economical to digitally control even more devices and processes. Mixed signal microcontrollers are common, integrating analog components needed to control non-digital electronic systems.

Figure 1.1: AVR ATXMEGA microcontroller

However, there is a catch, programming these microcontrollers is a bit tricky, it typically requires a special equipment, i.e. specialized development tools, these tools are both hardware and software. Generally, the more sophisticated the development tools are, the more sophisticated the final product might become. It's practically impossible to successfully write a computer program without testing and debugging it, especially program for a microcontroller. In contrast to more complex computers, like personal computers, smart phones, etc., microcontrollers have significantly limited native debugging capabilities. And that's where complex simulation software, various development related hardware, and other tools like that, comes into the game. Most of these tools which currently available on the market, or as various freeware or open-source tools, have a great potential for improvement, not to mention that a great portion of these tools are merely a nice toys rather that complete and stable products.

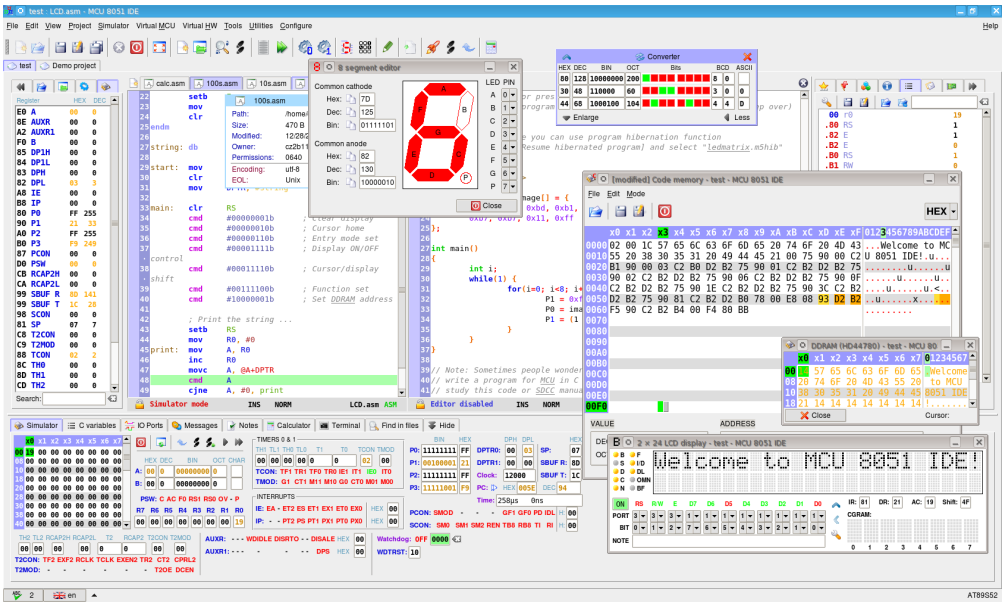
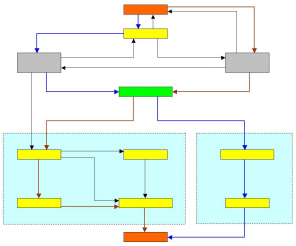


Figure 1.2: *The **MCU 8051 IDE** project: A complete integrated development environment for 8051 based microcontrollers, available for Microsoft® Windows® and GNU/Linux®.*

1.2 Vision of the project

The ultimate goal is to create an entirely new multiplatform development environment for microcontrollers and related hardware, using the most advanced technologies currently available. **Unlike other development tools** on the market, the result of this project is supposed to be highly modular and extensible, allowing us to distribute (sell) individual components for different purposes, and for different prices. In other words, there will be some "main IDE" (software), various hardware tools, and a set of additional plug-ins for the main IDE like:

- ☆ Package for LCD displays (simulators of character and graphical displays, font generators, etc.).
- ☆ Simulator extension package, code editor extension package, etc.
- ☆ Packages for digital potentiometers, thermometers, etc.
- ☆ Package for working with various communication protocols and interfaces.
- ☆ Package for UML (notable feature of this package might be **code generation from state charts**)
- ☆ Package for working with embedded operating systems (we would either buy, or write our operating systems for individual microcontroller architectures).
- ☆ Package for development with hardware definition languages (VHDL, Verilog, etc.)
- ☆ Scientific package (visual programming, working with various diagrams, abstract machines, etc.)
- ☆ ... and other packages, depending on market demands ...



The bottom line is that the IDE would be entirely like a "jigsaw", this is one of the most important things which should make our products different from the others. The project counts on that we might profit more from the individual extension packages than from the main IDE itself. It likely that having only the main IDE would make us facing too heavy competition, but having a diverse portfolio of basically different but related products might prove to pose potential for rapid expansion of our efforts to different areas of technologies, and make our customers more willing to become dependent on our products. I believe that one the crucial rules of survival in this industry is to make others dependent on us, noone wants to be dependent on a one big product, so our strategy should be **divide & conquer**. There is also emerging potential in programs for GNU/Linux operating system, and since there are practically no development tools for microcontrollers currently available for this platform, we would be practically **the first ones to provide them**. This might also prove beneficial for our business.

1.3 The mission

"It's better to reign in hell than to serve in heaven." – John Milton

Our mission is clear, the company must make money, and make as much money as possible. In order to achieve that we have to be able to sell as many products as possible, and sell them for as high price as possible. We will do that by the following means:

- ☆ promoting our products everywhere possible (and reasonable),
- ☆ making it appear that we are bigger and more stable company than we really are,
- ☆ attempting to convince others that being dependent on us is for their good,
- ☆ providing high quality products,
- ☆ expanding to new territories in attempt to seek out new opportunities for business, for example **new products**.

1.3.1 Potential customers

The Highest number of our potential customers are most probably in India, USA, and Germany. The local Czech market is negligible, it's far too small to be promising. Our potential customers are:

- ☆ firms focused on development related to microcontrollers,
- ☆ higher education institutions,
- ☆ students and hobbyists, for these people the main IDE might be for free but only the main IDE, nothing more.

1.3.2 The idea of innovation

① Advanced simulation capabilities including simulation of devices peripheral to the microcontroller.

② Multiplatform development tools allowing thousands, or tens of thousands, of engineers, scientist, and students, all around the world to use this kind of software and hardware tools also on GNU/Linux and Mac OS X operating systems.

③ UML (*Unified Modeling Language*) tools for microcontrollers, the most notable one is automated generation of finite state machines for microcontrollers. This probably poses a valuable potential in the field on industrial automation.

④ Extensibility, even by user (opened API for user defined simulation plug-ins).[1]

⑤ High simulation speed on host machines capable of multiprocessing.

⑥ The project is supposed to bring some of the tools common to more a complex computers also to the world of microcontrolles, like code profilers, measurement of software metrics, real-time operating systems, etc., some of these are already available on the market but only some of them.

1.3.3 Potential future

Open-source software probably will be the most valuable ally for us, but it time it might also endanger our business, in time tools like this might become open-source, effectively inhibiting many of business activities like the one we intend to conduct. We should be prepared for this in advance, so in case the IDE and its associated tools become successful, we will have seriously consider expanding to other areas, like:

☆ various versatile devices for industrial automation,

☆ field-programmable gate arrays (FPGA),

☆ our own microcontrollers and/or microprocessors (this might be too ambitious),

☆ other kinds of software (genetic programming, neural networks, etc.),

☆ et catera.

[1] Suggested programming languages for this are Java and Python. The language should be interpreted and portable across different operating systems without need for modifications in the code.

Chapter 2

Detailed description of the planned products

"If you are going to steal software, steal it from us." – Jeff Raikes (Microsoft executive)

2.1 Software

Our main products will be software. Currently there are plenty of software products focused on a development which is directly related to microcontrollers, there already are companies developing similar software and hardware as we intent to do, even independent individuals are doing so. However, there is still an area which is not entirely covered by these products, and that's where we should focus our efforts. So besides the main products, we are also about to experiment in certain uncharted areas of the market.

Figure 2.1: Our target platforms.

2.1.1 Concrete products

- ☆ The Main IDE[1]: basic product but not the main source of our financial profit, suggested price: ca. $190 a license.
- ☆ UML extension package: main feature would be automated code generation from UML state charts, etc., this particular product might significantly ease development of applications involving finite state automata, etc. suggested price: ca. $500 a license.

[1] Exact name of this component hasn't been decided yet.

- ☆ Scientific extension package, enabling usage of many basically "useless nonsenses" like the visual programming and other highly impractical stuff, suggested price: $300 a license.
- ☆ Various additional simulators, like simulator of HD44780 driven LCD display, and similar things, suggested prices for individual packages: from $10 to $1,000 a license.
- ☆ Packages for working with various communication protocols, like USB, etc., suggested prices for individual packages: from ca. $50 (simple protocols like: SPI, UART, USART, I^2C, etc.) to ca. $500 (sophisticated protocols like: CAN, USB, Ethernet, IP, etc.) a license.
- ☆ Packages for working with embedded operating systems, mostly our own operating systems, suggested prices for individual packages, including the operating systems: from $100 to $1,000 a license.
- ☆ Extension packages written, on customer demand, to fit individual needs of particular customers, prices for these packages would be thousands, or tens of thousands, dollars.

2.1.2 What we will not do

- ☆ We will not write our own C and/or C++ compiler(s). There are GCC and SDCC compilers freely available on the Internet as open-source projects, their licenses allows us to use them for our activities. We could save a big portion of valuable time by using them, and there is no point in reinventing the wheel.
- ☆ Stick to the main IDE. There other IDEs available, and even if ours would be the best one ever, and always, it's probably still not good enough to maintain the company indefinitely. And we wouldn't withstand the competition forever anyway.
- ☆ Make our software open-source, and hardware open-core, it would make it too easy to steal, and for the majority of end-users, it would be no advantage anyway.
- ☆ Become dependent on particular operating system, like Microsoft's or Apples' OS.
- ☆ Make our software unavailable to all people who won't buy it anyway, like students, it's only good for us when there is a plenty of people using it, even when we don't get money from all of them.

2.1.3 What might make us better than the others

- ☆ There are no professional grade IDEs capable of simulation of certain important peripherals, like LCD displays, various controllers, etc., reliable and well written set of individual simulators for these devices could significantly ease the development process and thus make our products more attractive. These additional simulators would be sold as individual packages allowing customer to configure the IDE to fit his or her specific needs.
- ☆ Most of the MCU simulators currently available are too slow, because they are mostly products of unexperienced developers.
- ☆ There are almost no professional grade IDEs capable to run on other operating system than Microsoft® Windows®, our products would run Microsoft Windows, GNU/Linux, and Mac OS X, so there is a good chance that we could quickly cover this slowly emerging portion of the market.

- ☆ Most of the development tools currently available are clumsy, there are not well written, slow, instable, etc. That's caused by that the people writting them are usually "a bit stupid", or at least they lack the necessary experience and expertise. We can easily profit from years of experience gained from the MCU 8051 IDE project, a successful worldwide spread open source IDE for MCS-51 based devices.[2]

- ☆ People who write development tools for microcontrollers usually doesn't have a background in software development, they can write software, more or less, but they are not good programmers. I personally have a strong background in development for POSIX systems as a software developer in Siemens AG., and years of experience with pure programming as an open source software developer. We could also gain advantage from the software technologies like Qt framework, SDCC compiler, GCC compiler, GNU/Linux operating system, etc., these things are usually unknown to writers of similar products, and even when they are aware of theme, they are not able to use them because they are typically bad programmers.

2.1.4 Random remarks to the software

- ☆ the main IDE:

  - ☆ There will be basically three separate parts running as separate processes, one for the GUI, one for compiler (SDCC or GCC), and one the simulator engine. We can take **very interesting advantages** of decoupling the GUI and the simulator engine as separate processes, one is performance on multi-core CPU machines, one is ability to run simulator on a different machine than the GUI, and the most important one is stability. Simulator engine is a component which would be a subject to extensive automated testing, it's not too hard to prepare a set of test cases for an automated testing environment which will do the work for us, however, it's hard to test the GUI automatically, so naturally most of bugs in the software will be in the GUI. When the GUI crash, the simulator will stop but remain functional, and mostly unaffected by the crash of the GUI, allowing for the entire application to cope with the crash more easily.
  - ☆ Everything possible will be written to be general in respect to the target microcontroller architecture, and configurable by user.
  - ☆ Files generated and/or used by the IDE, like project definition file, various configuration, etc., files, will be human readable or at least not binary, except for cases for which there is not other way. Asset of this feature is that user will be able to mess with those files, e.g. generated and/or process them by his or her own scripts and other tools.
  - ☆ Everything in GUI must look modern, the GUI should be full of tiny little gadgets in order to make it appear that it's **not an ordinary software**, it's the Software.
  - ☆ The first version(s) released will probably be useful only as education software, since many of features crucial for a real development might be missing there.

- ☆ Individual extension packages:

[2] The MCU 8051 IDE is today commonly used at universities and similar institutions all around the world, it's a project completely done just by one man and still it can match commercial products of similar kind developed by entire companies! The experience from this project are absolutely crucial, with them we can provide such products in considerably less time and with considerably higher quality than our competitors.

- ☆ Some of them will extend GUI of the main IDE, some of the will extend simulator, in both cases they should be **decoupled as possible**. They should communicate with the GUI via interprocess communication, not integrated directly into the main app. Extensions for the simulator engine, like simulators of displays, etc., should consist of two pars: GUI and the internal logic. The internal logic should integrate directly into the simulator engine, for performance reasons, and the GUI should run in a separate process, also for performance reasons and also to ensure higher stability of the software.
- ☆ People usually don't like big, complex, and expensive things, rather they prefer a set of small, easy to understand, and inexpensive fractions of something bigger, even when that's merely an illusion. So let's provide it that way, the main advantage of this approach, from our point of view, is that we can sell them something big, complex, and very expensive part by part. Suppose I want an IDE for microcontrollers, ok, I buy it and let's say I am satisfied, for now, but later I might realize that I want also this tiny little piece of additional software, ok, I buy it and let's say I am satisfied, but later ...

- ☆ Installation process:
  - ☆ for Windows we might use one of the following installers:
    - ★ NSIS (Nullsoft Scriptable Install System) – an open source system to create Windows installers,[3]
    - ★ Inno Setup – a free installer for Windows programs,
    - ★ InstallShield – a proprietary system to create Windows installers,
  - ☆ for Linux we use rpm-build (for RPM packages) and dpkg-deb (for DEB packages)

[3] This add-on might also be useful: http://www.graphical-installer.com/joomla/.

2.2 Hardware

"Good artists copy, great artists steal." – Pablo Picasso

This product requires hardware tools, for development and education purposes. Fortunately, there is a plenty of stuff for us to copy (steal), the only hardware we might get some trouble with are ICDs and ICEs but that's nothing we could not handle. We will need to be able sell these kinds of hardware tools:

- ☆ evaluation boards,
- ☆ In-Circuit Debuggers (ICD),
- ☆ In-Circuit Emulators (ICD),
- ☆ MCU programmers,
- ☆ other tools:
  - ★ bridges (e.g. USB->UART),
  - ★ various analyzers,
  - ★ cables, etc.

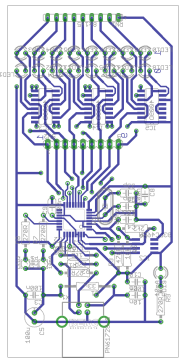


Figure 2.2: A printed circuit board digram.

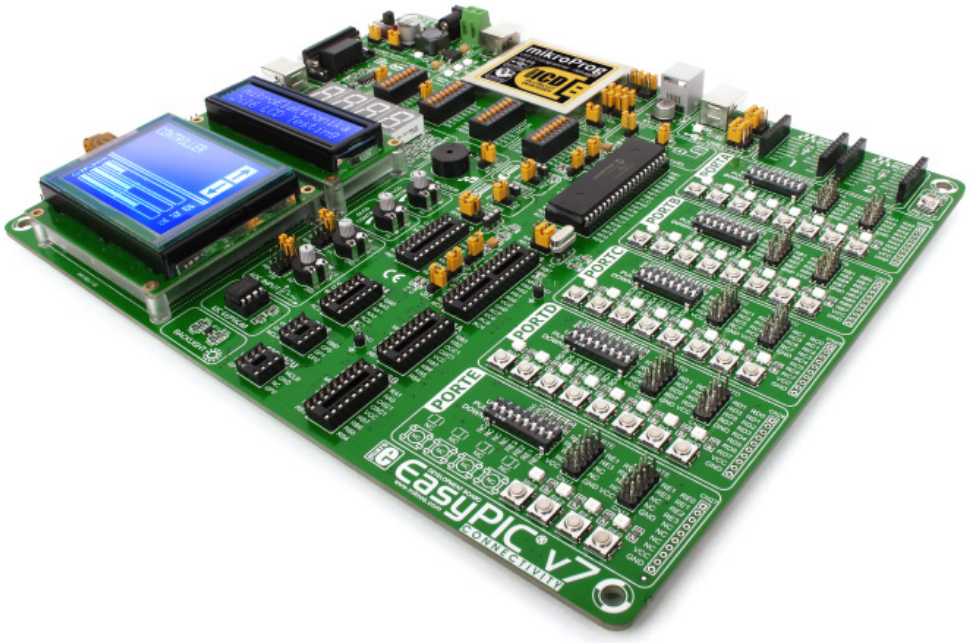


Figure 2.3: Some development board from the MikroElektronika company, probably out main potential competitor.

2.3 Other products

2.3.1 Technical support

We intent to provide so called "high quality technical support" for our products, like Microsoft does. Beside this "high quality technical support", there should be discussion forum on our web pages, and it should be also possible to contact the developers using email or phone.

2.3.2 Advertisement

Out commercials are supposed to be distributed using the Internet, that means: our web pages, YouTube, FaceBook, Twiter, Wikipedia, etc. The images and motion pictures should be playful, and should involve half naked girls,[4] nice music, and nice visual effects. Some inspiration could be taken from this: http://www.youtube.com/watch?feature=fvwp&NR=1&v=GPsxDZNoSHc.[5] However, inadequate advertisement, complexity of our work, misunderstanding, potential lack of sufficient operating capacity on our part, and market competition, might put this project in jeopardy despite even flawless solution of our main products.

2.4 Production process

During my work in the Siemens AG I have learned that small teams are best organized when they are self organized. So I suggest application of an agile software development process (a type of software engineering), the best choice might be the Scrum, although other methodologies are also applicable. Suggested scenario:

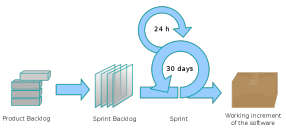


Figure 2.4: Scrum, an incremental framework for project management.

- ☆ there are a few teams focusing on different, but related, products and/or their components,
- ☆ each team start as one-man team,
- ☆ work is planned for short periods of time, at the end of this period the team presents the result to the "product owner" (it would be either a commission or some dedicated person),
- ☆ everything is planned, however, the plan is highly adaptive in order to make the teams operative,
- ☆ unless explicitly specified otherwise, everything is confidential (contracts might insist on that, if necessary).

[4] The rationale behind the half naked girls is that a great portion people working with computers, on an advanced level, watch porn and play computer games, so our commercials should naturally reflect this.

[5] This video is a bit stupid but there are certain interesting things about it, e.g. there is only one girl.

Chapter 3

Analysis

3.1 The market

3.1.1 Suppliers

We need supplies in the following fields:

- ☆ web pages (I know a guy who is very good in this stuff, he is a bit crazy but it doesn't matter),
- ☆ advertisement (I know a formed model who used to work in Milan, Italy, her experience might prove valuable),
- ☆ printed circuit boards, we might choose from companies like these:
  - ☆ APAMA SYSTEM,
  - ☆ A3,
  - ☆ Jaromír BUČEK, etc.

3.1.2 Competitors

Our main competitor will be the MikroElektronika company (Europe, Serbia), they do basically the same thing what we intent to do, however, our products are supposed to be far superior. What these people do is merely scratching the surface, we indent do go far beyond this basic level. Another interesting company is the KEIL company (Europe, Germany), they seem to be pretty good but they are targeting on different MCU architectures. In time, we might have to compete with them as well, and win, if possible. Other companies, like UNIS, etc. pose no thread for us, they focus on different fields of the market and probably lack a real potential to compete with us.

3.2 SWOT analysis

Strengths	Weaknesses
➹ Simulation of MCU peripherals. ➹ Automated code generation from UML state charts. ➹ Modular development framework. ➹ Advantage of already written open-source C compilers. ➹ High performance, stability, and security, by software design. ➹ Fancy GUI of the Qt framework. ➹ Multiplatformness of the software. ➹ Target MCU architectures. ➹ Low-cost workforce. ➹ Experience from the MCU 8051 IDE project. ➹ We might easily expand to more perspective areas of business from this starter product.	✪ Inexperienced team. ✪ We are in the Eastern Europe. ✪ Probably there is no potential to create a cash cow. ✪ The project might be too sophisticated. ✪ We might not be able to deliver the final product with satisfactory quality.
Opportunities	**Threads**
☆ Microcontrollers are heavily used in today's industry. ☆ Noone has done this before.[1] ☆ If we succeed, nobody will be able to match us. ☆ We could expand to our own microcontrollers.	➴ Our products are supposed to be honestly beneficial and innovatory. ➴ Companies like MikroElektronika, etc., might pose a hard competition for us. ➴ There might be not enough customers to keep the company alive. ➴ This product might be too specialized to be profitable enough. ➴ There are similar products for free. ➴ We might not gain satisfying credibility.

Table 3.1: SWOT analysis

3.2.1 Analysis of the strengths

I am strongly convinced that the project has some very serious advantages, you must understand that is a really not an ordinary IDE. This is an entirely different way of approach.

Simulation of MCU peripherals: this feature is the cornerstone of this innovation, no other set development tools currently available on the market has this feature supported as we intent to. Various peripherals connected to the microcontroller are very important, usually the only thing the MCU has to do is to control these peripherals, so having the simulated by software might pose a valuable asset for our customers.

Automated code generation from UML state charts: this might significantly ease development process of applications involving finite state automata, and it it also poses the potential to make our customers more dependent on our products. Finite state automata (finite state machines) are heavily used in today's software industry, so having this supported the software might be very valuable.

Modular development framework: it is our believe that having the software divided into several separate packages, having each of them sold separately for different price, and thus allow our customers to choose exact configuration of their development environment to fir their particular needs. We are supposed to benefit from this by being able to make more money by selling individual extension packages than by selling the main IDE itself.

Advantage of already written C compilers: other companies developing tools like these often write their own compilers for the C language, [2] we would skip this step and use the SDCC and the GCC compiler. These compilers are distributed and so called free software (free as in freedom), that practically means that they are open-source software. License used for these compilers is GNU GPL, this allows us to use them as external programs, which our software will strongly depend on, without having to ask for permission from their copyright holders.[3][4]

High performance, stability, and security, by design: the software is supposed to work as a "network" of mutually connected processes, i.g. threads and separate processes communicating via out proprietary communication protocol over UDP/IP, or TCP/IP, or basically arbitrary mechanism of interprocess communication. This means that the software can easily benefit from multi-core CPU host machines, which are most of the today's personal computers, and can be also less prone to random run-time failures caused mostly by program errors. From security standpoint, it will be harder to steal the product because the user has to steal all the components separately.

Fancy GUI of the Qt framework: it's a commonly know true that most people people are more or less stupid, so something made to look nice might impress them often even more than a real functionality. That's where we will come with a number of tiny little useless graphical nonsenses in order to make the GUI look impressive to a "common fool". The Qt GUI library can do a magnificent job here, and we can make more money.

[2] C language is an extremely popular technology in the field of MCU programming; while BASIC, Pascal, etc., are more merely a toys rather than serious industrial technologies.

[3] The Free Software Foundation (which holds the copyright of several notable GPL-licensed software products and of the license text itself) asserts that an executable which uses a dynamically linked library is indeed a derivative work. This does not however apply to separate programs communicating with one another.

[4] Basic questions about the GNU Project, the Free Software Foundation, and its licenses

Multiplatformness of the software: of course, the Microsoft's operating systems will be our primary target platform, however, there is another slowly emerging group of potential customers who prefer to use the GNU operating system based on the Linux kernel (GNU/Linux). If we provide them with top quality products compatible with this operating system, we might easily become dominant in this particular field of the market. Support for the Apple's Mac OS X is also planned for completeness, the rationale behind this is that if we have our software and hardware operational on Windows® and Linux®, it won't be hard to make it running also on the Mac.

Target MCU architectures: the idea is to make our tools targeted on the following microcontroller architectures:

① **AVR**: heavily used Harvard architecture 8-bit RISC single chip microcontroller, developed and manufactured by Atmel.

② **PIC**: *Peripheral Interface Controller*, another popular Harvard architecture RISC single chip microcontroller, manufactured by Microchip Technology, originally developed by General Instrument.

③ Maybe even other microcontrollers and microprocessors:

- ☆ ARM
- ☆ PicoBlaze (a soft processor)
- ☆ openRISC (a soft processor)
- ☆ 8051

Low-cost workforce: we are in the Eastern Europe after all, if we were Germans, or Americans, the workforce would be much more expensive.

Experience from the MCU 8051 IDE project: Our starter product is supposed to be an integrated development environment for microcontrollers, but a way different from any other, experience in this subject might prove very useful. In the process of development of such a complex product, there are many opportunities to make a serious mistake but the experience from the MCU 8051 IDE project should really significantly help us to minimize them.

We might easily expand to more perspective areas of business from this starter product: this a unique opportunity to start in a perspective field of industry, from here we might extend our company efforts to reconfigurable computing, robotics, industrial automation, etc.

3.2.2 Potential of the opportunities

"Ad astra per aspera." (Through hardships to the stars.)

Microcontrollers are heavily used in today's industry: there is a plenty of corporations and individuals who might benefit from our products but the exact number might be hard to estimate. I personally believe that in the world, there are tens of thousands of potential customers who could buy our products.

Noone has done this before: we could create something great which noone has done before.

If we succeed, nobody will be able to match us: the ultimate goal of this project is nothing less than to make the best IDE, for the targeted MCU architectures, in the world.

We could expand to our own microcontrollers: if our development tools are well accepted by wide audience worldwide, we might use them to promote design of our own microcontrollers.

3.2.3 Suppression of the weaknesses

"A lie repeated a hundred times becomes the truth." – Joseph Goebbels

Inexperienced team:

- ☆ we have to turn a weakness into a strength: there might be a potential in it, people with lack of experience are usually either adaptive (our case, I hope) or stupid (the most common case),
- ☆ nobody has to know about it,
- ☆ it's often legal to lie.

We are in the Eastern Europe: would you trust a company originated from Belarus or Ukraine? Would you trust a company originated from the Czech Republic? Fortunately, our primary target markets will be India and USA, in these confederations, people usually don't distinguish between different European countries, for them the entire Europe is like country. And for the European market, we might attempt to make it appear that we are from somewhere else:

- ☆ we won't say a word about the Czech Republic, however, we might refer to Moravia (nobody know what it is, so it's ok),
- ☆ we will maintain our we pages and products in English, there won't be word in Czech.

Probably there is no potential to create a cash cow: this product is not for ordinary people, so probably lack the potential for making a huge amount of money, but

- ☆ we can still make some money,
- ☆ we can expand.

The project might be too sophisticated: certainly the most important thing for a successful company is a good presentation of the company and its products, this product is too sophisticated for a layman to understand even what it is good for. So, it might prove likely that we might struggle to a small firm with a few employees. We will follow the following rules:

- ☆ basically, a lie repeated a hundred times becomes the truth, so we have to make our "truth" become the truth,
- ☆ we have to use any means necessary to expand, including those which some people may consider unfair,
- ☆ it is absolutely crucial that we present some of our products as genuine masterpieces, outcomes of an ingenious work. Most people are stupid and thus they will believe it, like with Microsoft.

We might not be able to deliver the final product with satisfactory quality: basically there are two solutions available:

- ① make it appear that the quality is satisfactory,
- ② improve the quality, this is supposed to be a desperate move.

3.2.4 Minimization of the threads

"The best defense is a good offense."

Our products are supposed to be honestly beneficial and innovatory: this is the worst thread above all, we will have to gain more experience, and in time we might be able to do less development and more business.

Companies like MikroElektronika, etc., might pose a hard competition for us: *"Vince Aut Morire"* (Conquer or Die)

we have to crash them, of course.

There might be not enough customers to keep the company alive: we make the customers believe that they need our products, even if the don't, and we make the prices higher.

This product might be too specialized to be profitable enough: we move to another product, ideally we steal somebody else's idea and call it our own.

There are similar products for free: these products lack satisfying quality, so they pose no real thread for us, but we will have to crash them anyway.

We might not gain satisfying credibility: we win a few prices, even if would have to make them up, we might also make up a fake prestigious contest and accidentally win it. This should improve our credibility, everyone like nonsense prices won in obscure contests. Common stupidity is like fire, it's a good servant but a bad master, so we have to make it serve us.

3.3 Finances

3.3.1 Rough income estimation

Suppose that in the world, there are thousands, or tens of thousands, of individuals who might buy our products, this precondition is probably quite reasonable. If we are able to profit about $500 in average from one individual, in a time period of five years, we will need only a few thousand of individuals buying our products to make millions of Czech Crowds a year. This should be sufficient to maintain a small company, however, I believe that there are three most probably scenarios:

- We make tens of millions Czech Crowds each year, the company would be successful and able to grow rapidly.
- We make enough money to be payed more than most of the common employees in this field of industry, but we won't be able expand further.
- We make not enough money to make it reasonable to keep the company alive and thus we terminate the project.

3.3.2 Operating costs estimation

Fixed costs

He have to maintain the company headquarters, if we are lucky, we might get some support in this matter from the JIC (*South Moravian Innovation Centre*).[5]

Variable costs

Mainly the hardware tools would generate variable cost, beside that, we would have to buy some software and hardware from other companies every now and then, either to use it (laptops, CAD systems, etc.) or to inspire ourselves with its design.[6]

3.3.3 Distribution of corporate profits

Distribution of corporate profits will be specified by a contract, the money will be distributed as investments to the company and to people behind the company. The more work a man do for this company, the more money he will get (so the more cocaine and sluts he can afford[7]).

[5] http://www.jic.cz/

[6] In other words, steal it.

[7] Money can be used even for different purposed than drugs and girls, however, I personally prefer these two. :-)

Chapter 4

Concrete goals and milestones

Each phase should end with a "retrospective", this is an important part, in retrospective, we look back on our work, think about what we might have done better, and what could we do better next time. All phases together should take about a year to complete, however, some of the planned work could be dropped, and/or addition work could be added.

4.1 Phase 0 - preparation

In order to reduce the number of mistakes, we have to plan the work and prepare for it. We need to get a proper understanding of the Qt framework, CMake, applied microcontrollers, etc., also we have to design software architecture, and make fundamental decisions about the hardware design. This phase shouldn't take more than a month.

4.2 Phase 1 - creation of the 1st functional version

The first functional version of the IDE should be implemented withing three months. List of features of the first version:

- ☆ Software - GUI:
  - ★ code editor with syntax highlight for C language and the Assembly language,
  - ★ basic simulator user interface,
  - ★ capability to work with C compilers, the MCU simulator, and assemblers.
- ☆ Software - assemblers:
  - ★ fully functional macro assembler for AVR,
  - ★ fully functional macro assembler for PIC,
- ☆ Software - simulators:
  - ★ a basic simulator for some AVRs,
  - ★ a basic simulator for some PICs,
- ☆ Hardware:
  - ★ a few boards for AVRs (it's better to have less boards with higher quality)

4.3 Phase 2 - improvements

This phase should take about three months.

- ☆ Improvements of simulation capabilities: nodal analysis, transient analysis, etc, simulators of a few thighs which look nice[1] like HD44780 driven LCD display,
- ☆ a few boards for PICs, and further improvements of our hardware,
- ☆ improvements of GUI, many many various tools

4.4 Phase 3 - further improvements

This phase might take about three months.

- ☆ Add features to make the tools quite great, like:
  - ★ spell checking,
  - ★ syntax validation,
  - ★ automated code generation
  - ★ various debugging tools,
  - ★ additional device simulators,
  - ★ further improvements of simulation capabilities (nodal analysis, etc., might allow us to involve much more complex simulation capabilities than any other IDE ever had!),
  - ★ further improvements of source code editor,
  - ★ further improvements of hardware,
  - ★ further improvements of assemblers,

4.5 Phase 4 - finalization

This phase shouldn't take more than three months. If everything goes well, the company should start in this phase.

- ☆ Debugging,
- ☆ web pages,
- ☆ meetings with investors and other people who might be interested in our products,
- ☆ further improvements of our products,
- ☆ establishment of the company.

[1] It might be quite motivating if the results are visible soon, however, they might not be entirely satisfactory at first.

Chapter 5

Annexes

5.1 The team

Team members are in alphabetical order.

5.1.1 Internal

Filip Lát

Martin Madron

Martin Ošmera

5.1.2 External

There might be also a few people who wouldn't be part of the team itself but could participate on the project (web pages, etc.)

5.2 Interesting links

- ☆ http://www.keil.com/dd/search_parm.asp : quite clever solution of a user friendly web catalog of microcontrollers.
- ☆ http://www.home.agilent.com/agilent/product.jspx?cc=CZ&lc=eng&ckey=1297113&nid=-34346.0.00&id=1297113 : an interesting commercial.
- ☆ http://sourceforge.net/projects/ktechlab/, http://www-mdp.eng.cam.ac.uk/web/CD/engapps/ktechlab/ktechlab.pdf : a very interesting software tool.