

LARGE SOFTWARE PROJECTS

Risking Life and Limb

By

Ansar Muhammad
&
Rahim Hasnani
(Contributing Author)

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WHO SHOULD READ THIS BOOK

This book primarily has been written for new project managers who are just starting out with large software projects.

We hope that this book will also help anyone who is involved in the development or implementation / deployment of large software projects. They can belong to the technical community or to the large community of users / sponsors / stakeholders who receive and use the ultimate end products / software.

INTRODUCTION

This book tries to explain some of the key concepts of managing large software development projects in the form of a story.

The idea is borrowed from Patrick Lencioni, whose books like “Death by Meeting” and “The Five Dysfunctions of a Team” have shown that it is better to teach through examples and stories than to give theory and more theory. The lessons learned through this approach tend to stick in the reader’s mind long afterwards.

We have tried not to cram too much information in this book; instead we have taken a few themes that we want to talk about and focused on those only. Some of the themes discussed in this book are dividing a project to manage it better, managing scope creep, managing productive teams, writing good requirement specifications, etc.

We have divided the book into three parts. The first part “The Story” covers a story which gives the reader an understanding of the issues involved in managing large software development projects. The second part “Lessons Learned” explains the thoughts expressed in each chapter to highlight the message and theme behind the conversation. The third part “What you should avoid?” tries to list most of the mistakes that you should try to avoid while planning and executing large

software projects. This list is a work in progress.

There are many good books from Steve McConnell and other authors who have written on software development methodologies and software project management practices and we would encourage our readers to read these books as well. Life is just too short to learn from our own mistakes!

You should be able to read this book in a few hours and that is exactly the idea; to keep it short and simple. We have tried to make the book interesting so that you can read it as your bedtime story book!

This book is part of a series that is planned to be written so that our readers get good exposure to most of the key concepts related to the topic at hand.

PART 1

THE STORY

SO IT BEGINS

It is 9am and Ahsan, a project manager with three years experience of managing small/medium sized projects, has just reached office, though the morning is yet another crisp and beautiful Karachi winter morning, he is in a pensive mood, today he has to inform his senior management whether their software house should bid for the recent project or not.

Ahsan works for a software house, InsurSoft Pvt. Ltd. that specializes in building software for Insurance companies that don't believe in off-the-shelf packages. They feel that these products just don't have all the required functionality.

Recently they have been approached by an Insurance Company, PakInsurance, for an Integrated General Insurance application for all lines of business which include Marine, Fire, Motor and Engineering Insurance.

The major problem that Ahsan sees in PakInsurance's approach is that they seem oblivious to the nature of such projects. They currently have a very rudimentary system which partially caters to their business needs. There are a lot of excel sheets moving around and knowledge of business processes is more or less with individuals. On top of that they expect the system to be built and implemented within a period of 1 year. The implementation would not

only include their head-office but dozens of branches all over the country.

InsurSoft already has a decent product which covers a good bit of General Insurance business, but it would need a full re-write because the client is under the impression that the software must do 100% of all their business functions and nothing would be outside the system.

Ahsan knows that the client has deep pockets and can actually foot the bill. The real issue is the very tight time-line and very high expectations from the system. He has had numerous sessions with the IT manager of the client, Ayesha, who is quite good at managing an IT department. Unfortunately, she has very little exposure of implementing such large software systems.

Ayesha has explained to Ahsan the company is growing very fast and is in desperate need of a full fledged well integrated system which would not only manage the business but also help it grow smoothly and without disasters.

She has also explained that this is the first major software implementation in the company's history. They have reviewed many off-the-shelf products but did not find any which covered their requirements even 50%. They both understand that a good bit of business process re-engineering is required to implement off-the-shelf products and the company is just not ready

for so much change. So they have gone for the easy way out, build a product from scratch that fits the organization like a glove.

If it wasn't for the time lines, Ahsan would love to work on this project because it would not only pay good money but also help mature their current General Insurance Product. To make matters worse, he also knows that a lot of change management would need to be done in the process which always takes so much time.

ALL THAT GLITTERS

It is 2pm, Ahsan has just returned from lunch, he had spent almost all the morning preparing and reviewing his risk list. There were just too many of the risks which had a good probability of occurring. He has enough experience to know that for each risk he can put in place a good mitigation strategy but some of these would still not be able to save a schedule slip if a event occurs.

A quick call to Ayesha also did not help. She is clear that price is negotiable but time-line is not.

It just doesn't look right. Ahsan must tell his senior management that this project is a non starter. He would have to explain to his management that the client has to be flexible as regards to the following points otherwise it would not be feasible to bid for the project.

1. Deliver 100% functionality
2. Deliver full functionality within 1 year
3. Deploy at head-office and all branches within 1 year

TROUBLE

It is 5pm, Ahsan is supposed to meet Kamran, who is the Director for customized development in InsurSoft. Kamran's secretary's call interrupted his musing and within minutes he was in Kamran's room getting ready for the discussions ahead.

"So what do you think about this great opportunity", said Kamran. "Well, there is a positive and a negative side to it", said Ahsan with a bit of a concerned look.

"Say your mind", encouraged Kamran. Ahsan continued, "The positive side is that the client understands that it would cost a good bit of sum to get this project right and it would also give us a chance to mature our product line. The negative side is that the client wants it all done in one year along with a bucket full of functionality thrown in".

"Have you tried talking to them about these points? Maybe they just need a little education in this area", offered Kamran.

"They have a smart person as their IT Manager and I have had numerous discussions with her. Unfortunately, none of their senior team has had exposure to large software implementations and they think that anything can be accomplished if the budget is big enough. To top it all they

want the implementation done at their head-office and all their branches within this time frame of one year”, continued Ahsan.

Kamran leaned forward as he began to speak “Ahsan, this project is coming in at a very important time, as you know that for the past few months business has been a little slow and we have not been able to bring in enough work for our large development team. We must not let this project slip by because we need it to maintain our cash flows.”

Ahsan continued, looking more grave now “I understand that but the risk list is just too long and the client is just too naïve. They are not ready to listen to logic and I know that although they like our work and would probably prefer us over any other competitor, I am afraid if I push too hard they would actually take away the project from us. I don’t know how to balance our company’s need with the lack of understanding by the client. We should not get into any project that could eventually get us a bad name. A project of this size can hardly be developed in one year leave alone doing implementations all over the country.”

Kamran was now being more persuasive; he continued “Look Ahsan, you have been with us for many years now in your capacity as Project Manager. You know that somehow we have to manage the risks and succeed with this project. I am afraid I cannot offer you any immediate solution to your predicament but do some

thinking on it and figure out a solution. We must do our best to close the deal.”

Ahsan took a deep breath and requested for his leave. He said that he will sleep over it and get back to Kamran in a couple of days.

THE INNER VOICE

It was 9am the next morning and Ahsan was walking from the car park to his office. He had had a disturbed night. He was convinced that the client's attitude is not correct and that getting into this project could spell a lot of trouble if the client stuck to his guns with respect to the following points

1. Deliver 100% functionality
2. Deliver full functionality within 1 year
3. Deploy at head-office and all branches within 1 year

He had done some rough estimation based on his experience with Insurance Software in general and General Insurance Software in particular. The full effort was coming out to be about 125 person-months. He also knew fully well from experience that the below equation to convert effort into schedule held true in most cases:

$$3 * \text{effort-in-man-months}^{1/3}$$

Through this equation the result was working out to be $3 * 5 = 15$ calendar months of schedule. How to explain this to Ayesha? She would insist that such equations can be proved wrong with a strong motivated team.

This thought made Ahsan even more worried, two of his best developers had just resigned, one wanted to pursue a higher educational degree and the other was moving to an Insurance

Company which had made him an offer he just couldn't refuse.

With a new team Ahsan would be lucky if it could make the more conservative schedule of

$4 * \text{effort-in-man-months}^{1/3}$

Which worked out to be 20 calendar months, this would definitely not be acceptable to the client.

He decided to call his old friend, Danesh, from the days when they were together at the computer science college.

EXPERIENCE

Danesh was amongst those sincere people who one could always turn to for good advice. He not only had a good heart, always available to come to your help, but a strong craving for knowledge which made him read all available material on software project management, his pet subject.

Ahsan waited patiently as the phone rang at the other end. Then somebody picked up the phone and Danesh's familiar voice chirped in. Ahsan cleared his throat and began to speak "Hi! Danesh, how are things? This is Ahsan. I hope I have not caught you at a busy time?" Danesh immediately recognized his old friend and they exchanged greetings and well wishes. Ahsan then came to the point and gave Danesh the details of his predicament.

"Hmm. Sounds like you are in quite a soup! If you are free in the evening then it would be better to go over these details face to face. By then I would also get some time to think about all the information you have just given me", said Danesh.

Ahsan was delighted that Danesh was willing to not only think about his problem's solution but also offer dedicated time for his friend.

They set up the time and venue and the call ended.

KNOWING WHAT YOU WANT

Ahsan was already at the restaurant when Danesh reached. They ordered the meal and settled in for the important conversation.

“So why is your client in such a hurry to get the software? I believe they must have serious expansion plans. Personally, in such situations it is best to get a decent off-the-shelf product and implement a vanilla version”, mused Danesh.

“Yes, but these guys are different; they are convinced that their business processes are already very lean and agile and that there is no off-the-shelf package out there which delivers on their process requirements. I know for a fact that they have done a lot of homework”, explained Ahsan.

“So what you are saying is that their process and controls are their competitive advantage?” asked Danesh.

“Yes, quite right. They are very impressive when it comes to continuous quality improvement initiatives. Their senior management has gone to great lengths to make the organization very agile. From their point of view waiting a year is a lot of time and that is why they don't want to change even a single piece of document or process step unless and

until we really have a very good case”, continued Ahsan.

“I personally feel that you have a very good client who just needs a little education on the way the software is developed and implemented. The challenge is to convince them somehow that it is better to go slow and steady then to rush in and end up with a low quality product. What software development methodology are you planning to use?” asked Danesh.

“Well, we are very strong with the Rational Unified Process (RUP). It gives you the flexibility of iterations and yet organizes the project quite formally into phases. For all large projects we generally go down the RUP path” explained Ahsan.

“My friend this project may not deliver the fruits your client is looking for unless and until you throw in a good flavour of Agile software development. Remember, the client is strong with processes and controls but weak with exposure to software technology. They might not know what they want till they see it. It might be too late by then” advised Danesh.

“Tell you what, let me contact Marium and see if she can spend sometime with us to sort out things” continued Danesh.

Ahsan had heard about Marium, she was a very senior software development practitioner and very strong with delivering large software projects. She was 5 years senior to both Ahsan and Danesh and was considered an expert in the area of managing competing and conflicting priorities. Ahsan considered himself very lucky to get advice from such an expert.

He requested Danesh to get time from Marium in the next couple of days since he could not wait any longer. He was afraid that the client would sense that he was getting cold feet and look elsewhere for a software solution.

THINK BEFORE YOU LEAP

Danesh had been able to convince Marium to give them an hour so that they could get some guidance from her experience. They had both arrived early at Marium's office who ran her own software consulting and advisory company.

Danesh started the conversation by giving her a full background of the situation. Ahsan joined the conversation whenever he felt there was a need for details.

After the first 15 minutes Marium had already grasped the scenario but asked Ahsan to give more details of the required functionality.

Ahsan explained that the company primarily dealt with four lines of general insurance business. Namely: Marine, Fire, Motor, and Engineering. He also explained that the software workflow generally steps through

- Quotation
- Policy administration
- Premium accounting
- Claims
- Re-insurance
- Renewals

Marium then asked Ahsan how he wanted to proceed with the software development.

“Well considering that we have good exposure to the business; it is evident that there are similarities within the different lines of business. This means that if we can do a thorough analysis of all the requirements of all the lines then we could build reusable code to cater to the whole software” explained Ahsan.

“But Danesh mentioned that the client is not very comfortable with technology so how will you ever know that they like what you are building for them” asked Marium.

“Well, we follow the RUP process and do give executables to clients at the end of each iteration. Generally our iterations are two to three months apart so the client has a good feel of the product before we go LIVE” explained Ahsan.

“But remember that the client is not willing to absorb any schedule delays so if you get feedback at large time intervals you will never have the chance to correct your course and still deliver” continued Marium.

Danesh came to Ahsan’s rescue and explained that this is exactly why they had come to Marium. They wanted an approach which would manage the risk for both the parties, InsurSoft as well as the client.

Marium turned to Ahsan and asked “Have you asked the client to split the project along with the contractual and payment details? That way you can do requirement gathering in phase-one and then build the product in phase-two. This way both the parties have the flexibility of walking away after phase-one if the risks are still unmanageable or the relationship is just not clicking”.

Ahsan explained, “This was discussed with them but they seem convinced that a fixed price project end-to-end is what they need. Probably they think that it would give them a better negotiating position”.

Marium shook her head “The same old story. Ok, let me think about what we can do. Please give me a call tomorrow; hopefully I will have something for you to use”.

Danesh and Ahsan both thanked Marium for her time and headed back to their offices.

DIVIDE AND CONQUER

It was 11am the next morning and Ahsan was about to make the call. He really could not think of any new option that Marium could come up with. This was the test of experience and he hoped that Marium would pass with flying colours.

He made the call and found Marium on the line. After the initial pleasantries Marium started to speak thoughtfully “Ahsan, I have given your scenario a lot of thought and it seems that you should not get into this project because the client is not open to discussions. Danesh had explained to me that the client is very sure about their business process, but frankly whenever a software implementation takes place there are always changes to the way things are done. People who do process re-engineering without consideration of efficiencies brought in from automation need to re-look at every process to ensure that the right benefits are delivered. With the cost of software development these days, the return-on-investment cannot be justified unless this process is followed.”

“Yes, I understand, but how should I make the client understand” wailed Ahsan.

“There is a way; we have to work with the client to slowly make them understand. I suggest you prepare a very good presentation on how and

why so many software projects have failed. If you can deliver the presentation to the client in an effective way it would at-least make them open to listening”.

“When you find that the client is ready to listen then you can put the solution on the table which I am now about to offer you”.

Ahsan was now very interested and was all ears “Go on please” he exclaimed.

“What you need to offer the client is two proposals to be approved simultaneously. One of the proposals would be to build the whole solution end to end and implement at the head office and a few branches for only one line of business, say Fire Insurance. This way the project and related risks become manageable. One may think that this way your analysis would be incomplete because you have not analyzed and designed the whole solution and have sort-of jumped in with the concrete application” continued Marium.

“Yes that is what I was just thinking and won’t it raise the total cost of development?” asked Ahsan.

“Yes, it may but this is where Agile methodologies complement the ever popular Rational Unified Process. Agile methodologies believe that the client should be exposed to

production quality executable as soon as possible. This way they would get a first-hand experience of the real thing. As time goes by they will realize that this approach gives them much more flexibility than the previous approaches. If they are serious about achieving competitive advantage through their business process and controls then this is the only way to go” continued Marium.

“Please go on” said an excited Ahsan.

“You may need to have short iterations of 3 to 4 weeks and a production quality executable to show to the client whatever functionality you planned to build for that iteration. It would be nice if you could time-box the iteration period and your iteration plan should reflect all these details. If your team is relatively new then your approach could be test-driven and you can use pair-programming and daily builds to supplement the quality and stability of your application” continued Marium.

Ahsan was now gleaming with excitement and added “I am beginning to understand what Danesh was saying sometime back about a project that exposed the client’s readiness by making part of the functionality available for production environment. The client backed off from the aggressive schedule when they realized that they themselves were not ready for the aggressive GO LIVE date”.

“In this case if we build the whole process from quotations to renewals for one line of business then the pressure would be on the client to go ahead with the GO LIVE. This way if all goes well we can be sure that the rest to follow will also go well. But if there are issues then the project would be small enough to make timely corrections and the impact on GO LIVE date would be minimal” continued Ahsan.

“Yes exactly. The client would have had enough exposure by that time to understand what exactly is software project risk and why business processes need to be revisited in such a project” continue Marium.

“And now we should discuss the second proposal. This is the one where you propose to gather the requirements for the whole project as a separate simultaneous effort. This is required because the client has to have the comfort that while you are building the product for one line of business another parallel team is working on the overall project specifications” explained Marium.

“Ok, so what you are saying is that by the time the first project completes and we GO LIVE with one product line, the client has enough exposure to properly plan the overall project. It seems like a fair option because it would give the client the flexibility to go to another software company for a fresh bid in case he does not like our work or finds us too expensive. I am sure that we will come up to

their expectations but in my presentation I can make a good case with all the strengths of this two-proposal scheme” mused Ahsan. “In this way both we and our client would not have lost any time because a full requirements specification would be ready and signed off by operational units of PakInsurance.”

“So are you good to go? I see that you have understood the gist of our risk management strategy. You are a good learner” said a happy Marium.

“Yes, I can’t thank you enough. Really appreciate all your help” said Ahsan.

They chatted a bit more on the value of thorough planning and completeness of the project task list and then the call ended with Ahsan profusely thanking Marium.

DO THEY LIKE IT TOO?

Ahsan went over the details of Marium's advice with Kamran who liked the approach. The big question was whether the client would like it or not?

They setup the meeting with Ayesha and the senior management of PakInsurance. It was going to be a tough two hour session where the first hour would be Ahsan's presentation on the approach and the software development and implementation methodology and the second was going to be a more interactive session on the overall cost and schedule of the project.

Kamran and Ahsan had worked very hard on the two proposals and had put in good bit of details about the methodology, technology, costs and schedule of development and implementation / deployment / cut-over.

THE BIG DAY

Ahsan and Kamran reached the meeting venue about 15 minutes before time to check the arrangements and be ready for the presentation.

Ayesha and senior management of PakInsurance came on time and they had a quick introduction cycle. Ayesha made it a point to introduce Eihaab who was a young man with a pleasant personality. Ayesha introduced him with the remark that he was their systems experience guy. He had recently joined PakInsurance from a large Insurance company which had very good information systems. He was the information system's coordinator for the company and was part of a lot of large IT projects. This was a relief for Ahsan because now he knew that in Ayesha and Eihaab he had two people who could understand the complexities of a large software development project.

Ahsan had worked very hard to prepare a good presentation and it showed when he spoke. The presentation lasted about 40 minutes and Ahsan took questions at the end. One executive asked why they were deviating from the original plan of one fixed priced project proposal. Another asked why they wanted to build just one business line instead of all the business lines. A third could not understand why just write requirement specifications.

Ahsan and Kamran fielded the questions and tried their best to explain why it is important for overall software quality and its ultimate success to split the risk. They explained a little about the long slow process of change management and how it would affect the success of the project.

There came a time in the discussion when Ahsan thought that they would lose the bid. This is when Ayesha and Eihaab came to the rescue. Ayesha explained to her team that as part of the due diligence exercise they had contacted some of InsurSoft clients for their responses. Almost all of them were very happy with the quality of work and the smooth transition at GO LIVE. Some lamented about the high fees and the long schedules but still insisted that InsurSoft was by far the best vendor in their market space.

Eihaab added value by talking about one particularly bad experience an ex-employer had with a large project. They had a good relationship with a small software vendor and had found them quite good at delivery of small projects. They made the mistake of giving them the development of the enterprise software and realized that it was just too much for them. Large projects have their own eccentric behavior and require substantial experience to plan and execute these the right way. He further stated that the approach that Ahsan had brought in was truly impressive and showed his own and his organization's ability to envision such large assignments.

Ahsan could tell that Eihaab had been well briefed by Ayesha and she had done a good job of highlighting all the pitfalls that Ahsan had discussed with her. He felt that there was a good bit of trust developing between the two organizations and things were finally working out.

The head of IT, Ayesha's boss, finally remarked that it was now time to close the deal. He said that PakInsurance will get back to InsurSoft within 5 working days with a final "Yes" or a "No".

They all exchanged greetings and left.

On the way back, Kamran congratulated Ahsan on a great presentation. They both wished that PakInsurance would give them the project but felt satisfied that they had done their best.

BULL'S EYE

On the fifth day from the time of the last meeting, Ahsan got a call from Ayesha and got the good news that they had been awarded both the projects.

This meant that he needed to immediately make efforts to mobilize the teams and the mobilization period was set to 1 month in the proposal, both projects were to start simultaneously and finish within 5 months of the start.

Ahsan first called up Marium and informed her about InsurSoft's successful bid. He again thanked her for the valuable time and guidance she had provided. He then called up Danesh and gave him the good news.

“Danesh, can you spare sometime to discuss some of the finer points of Agile methodologies. Marium had explained to me that for this project I will need to use a blend of Agile along with our RUP. I am not too sure whether I fully understand how it can be done.” Ahsan requested.

“Don't worry my friend; let's meet today evening at the beach for a stroll and a chat. Some fresh air would do us both some good. Later you can treat me for dinner at the lovely restaurant near the beach. They say that the

buffet is out of this world and so is the price. I have been advised that one should always go there when someone else is paying”, joked Danesh.

Ahsan confirmed the time and rendezvous point and put down the phone.

THERE IS METHOD TO THIS MADNESS

At 6pm they had both reached the rendezvous and ditched their shoes to enjoy the soothing feeling of beach sand under their feet. The breeze was cool and the weather was perfect.

“So what do you and Marium mean when you say that we will have to bring in a flavour of Agile methodologies to our RUP?” asked Ahsan.

“Well, as you know very well already that RUP is very good when you have large software to build and there are technology and performance risks involved” responded Danesh.

“But this case is slightly different; here you have a client who is keen to start using the built functionality in their day to day business. This means that you have to build production quality code from day one and then actually deploy it early to deliver the benefits” continued Danesh.

“Additionally the client is not very technology savvy so they don’t understand the inherent complexities of business process automation. This means that you could experience the “I don’t know what I want, but that’s not it!!” syndrome if you wait too long to show the concrete product features to them. That is why you should not go for typical 2 to 3 month iteration, but instead you should have 3 to 4 week iterations at the end of which you will be

delivering production quality executable to the client to review, test and give feedback.”

“To top it all, you have had attrition in your team recently so the team is not very experienced with the domain as well as the tools. This means that you need to time-box your iterations for better control and have visibility into the project status” continued Danesh.

“You can call me dumb, but really what does time-boxing mean?” asked a confused Ahsan.

“It is a simple concept really. You decide on the functionality you want to build in your iteration plan at the beginning of your iteration but then after about 2 weeks you check your status and realistically see if you can meet all the objectives of the iteration plan. If not, then at that time you decide what you are going to drop from your iteration so that whatever is shipped at the end of the iteration is production quality and complete in its function” responded Danesh.

“Oh, so you mean to say that if I decide on doing 4 use cases in a particular iteration and realize mid way that I can only finish 3 then I should drop 1 use case and build only 3. I understand that these should be production quality and I should still finish the iteration on the end date and not move the end date” continued Ahsan.

“Yes exactly! You are a quick learner. By the way you could even do a bit of the 4th use case, for example, if it has in addition to the basic flow, 5 alternate flows then you could decide that you do just the basic flow and 1 alternate flow. Get the idea?”

Danesh only waited for Ahsan to nod and then moved on to explain that Agile methodologies recommend that you write your test cases very early, ideally even before development starts so that you are producing high quality code from day one which is well tested. He further explained that certain sensitive and complex functionalities are best developed using pair programming which also leads to less bugs in the application.

“My personal favourites are the daily builds. They really bring things under control especially with a large team. You can financially invest a bit into a build generator and a regression testing tool which can make this process quite automated and simple” continued Danesh.

He further explained that Ahsan should review material on Agile methodologies and promised to lend some related books to Ahsan.

They finished the conversation just in time to see the sunset on the horizon. The meeting

ended with a sumptuous dinner paid for by good old Ahsan.

THE TRUE TEST

The next morning Ahsan busied himself in making detailed plans for the two projects. He had already discussed with Kamran that they would have two teams. One lead by Abeer and the other lead by Minha.

Abeer was very strong technically and would be leading the development team building the product. The business line they had selected after discussions with Ayesha and Eihaab was Marine Insurance. It was not as big as Fire or Engineering Insurance and not as small as Motor Insurance.

Minha who was the business analyst on the InsurSoft team was going to lead the team of business analysts who would document the full software requirements specification. In RUP terms they would build the complete Use case model and related use case descriptions and get these signed off from PakInsurance.

Minha's team would need to be mobilized immediately since they would need to start with use cases for Marine Insurance. This way some time saving could be made on behalf of Abeer's team.

Both Minha and Abeer would report to Ahsan and he would be the overall project manager.

Kamran and Ahsan had also setup the Project Management Team (PMT) and had confirmed names of participants for it in consultation with PakInsurance senior management. The PMT would meet every two weeks and a running score card would be maintained of delays caused by either side. This means that every two weeks there would be a cumulative number presented to the PMT in terms of signoff delays, feedback delays, testing delays, feature completion delays, etc.

This would put things in black and white and highlight to the PMT if any team is not performing either from the client side or from the InsurSoft side.

Since the product development effort was worked out to be approximately 20 man months. It was envisaged that it may be achievable in 5 to 7 months. This was going to Abeer's challenge to complete in 5 months. Abeer would lead a team of 5 developers. 2 would be old hands and 3 new programmers. Abeer was already strong with RUP and was now reading up on Agile practices to have more skills/tools available to him for managing his team and production of a robust piece of software. A big advantage that he had was that a decent reusable class library was available to him which covered a lot of general insurance functionality. He had to ensure that it was extended in such a way so that its functionality while increasing; remained extensible and reusable.

Minha was going to go in with two other analysts. One would cover Marine and Fire and the other would cover Motor and Engineering. Minha had the advantage that her whole team including herself had been closely involved in previous general insurance system projects which were for smaller insurance companies but had given them enough exposure to understand the business workflow.

Ahsan had called them both for a kickoff meeting and it was planned for the afternoon, straight after lunch.

NEED SOME LADY LUCK

Ahsan reached the meeting room at the scheduled time of 2pm. Minha and Abeer were already there. They had all worked on different projects together and knew each other well.

“Looks like we have a tough project on our hands!” remarked Minha as Ahsan walked in. She had read through the meeting minutes of sessions with PakInsurance and had also gone through the high level plans and presentation material circulated by Ahsan.

“Yes, this is going to be quite a challenge” added Abeer who was still going through the material and had only browsed the plans.

“People, the fact is that we needed this project badly, you already know that the past few months have been a bit slow and cash flow was becoming an issue” responded Ahsan. “We needed the project both from the perspective of cash flow as well as from the point of view of growing the business in the right direction. This project lets us kill two birds with one stone”.

“Don’t be so apologetic boss. We have seen worse. Frankly we are very impressed by the way you have broken the project and convinced the client.” chirped Abeer.

“Well, I am glad you like it! Let’s discuss the detailed approach we want to take. Then each of you will get 2 working days to come up with detailed plans for the project. Abeer, I don’t expect you to plan more than the Inception phase at this stage but Minha, you need to plan out which business lines you will finish when. Make a list of all the business lines that PakInsurance is into at the moment and we will take it from there. Does that sound ok?” asked Ahsan.

“Yes, sounds good” they both replied.

“See you in two days then. Finish up on all the material I gave you, it will help you understand the project dynamics better” added Ahsan while getting up as a gesture to indicate the conclusion of the meeting.

IS EVERYONE ON THE SAME PAGE?

Ahsan arranged a meeting with Ayesha and Eihaab because he wanted his team leads to meet them and also to get firm time commitments from relevant users.

Ayesha and Eihaab were already seated when Ahsan, Abeer and Minha walked in to the meeting room at PakInsurance. They exchanged greetings and introductions and then Ahsan began to speak tentatively.

“We have a challenging and exciting project on our hands and it would take a lot of efficient coordination between us to get the project to its completion within the time frame. Abeer and Minha are working on detailed plans and would be sharing the same with you in a few days”.

“Although we have left out some of the details from the project charter to keep the charter on the lines of mutual trust and understanding, it would be imperative that we have rules and guidelines defined so that all participants commit the same level of time and energy to this project” continued Ahsan.

Eihaab took advantage of the silence and began to speak “Yes, I noticed in the project charter that you have left out points like turn-around time for use case signoff, testing signoff, etc. in a way it was a good gesture but my experience

is that by keeping more things in writing and having formal communication the project is managed in a better way. There are many things that go wrong and it should be clear who is behind the delays.”

“Yes, that is my experience too but when I thought about you and Ayesha being such great help, I dropped the relevant clauses from the project charter. What I plan to do is keep a running score card of the delays from each side and present them in each PMT” responded Ahsan.

“Ok, sounds good. Let’s discuss these clauses against which we will measure the progress/delays. I recommend that our users should signoff each use case within 3 working days of receipt. This way they would be under commitment to spend the time to study the same and respond” proposed Ayesha.

“Yes, that would be great. Additionally, we will be submitting a new software release with incremental functionality every 3 weeks. It would be important that these are tested within 1 week and responses are given through our on-line bug tracker application” added Ahsan.

“Going back a little to our use case description signoff, what would happen if we find that the use case is not as per our understanding and we want to propose changes to it?” asked Eihaab.

Ahsan looked towards Minha, who now began to speak “Generally for application domains where we have a good grip on the business knowledge, we have seen that one correction cycle is good enough. That means that once we submit the use case after detailed discussions with your line managers, we expect them to review and highlight all modifications in one go. Then we make the modifications to the document and submit again which is then signed off. Sometimes an after thought may result in a qualified signoff but that happens rarely.”

“Sounds good! By the way how do we handle wish lists in an environment which has very good processes and with little room for improvement?” asked Eihaab.

“Some users just get too many half baked ideas and these cannot be brought in to the application without un-necessarily complicating the whole application design. This is always the trickiest part where we would need a lot of help from you and Ayesha. Abeer here is an expert negotiator and will try his best to keep things on track with your users” responded Ahsan.

“Minha on the other hand will not try to curtail the ideas instead she would encourage these because her part of the project is just to document all the use cases for all lines of business and for the full workflow” continued Ahsan.

“Ok, so that is why our two pronged strategy should work. On the one hand we give an open forum to the users where they can express their ideas and thoughts and also see them included in the requirements document. At the same time the development team working on Marine Insurance is building a more realistic system and getting them to use it and get exposed to the concrete side to their ideas” added Ayesha who was now looking very excited.

Ahsan looked at his watch. They were almost out of time. “Looks like we are all on the same page. Eihaab and Ayesha I thank you again for all your help. We will write the minutes and circulate for review and approval. Please share these with your senior management and get their full support. Minha will be in touch with you with regards to contact points for each business line and department for example who we should contact for Marine underwriting/policies, claims, re-insurance, renewals, etc.”

The meeting ended and Ahsan’s team left for their office. On the way back Ahsan asked Abeer to see him the next morning. There were some things they needed to plan. He also asked Minha to write the minutes and send these over for his review before circulation to the whole group.

THE SUM OF ALL FEARS

“May I come in” asked Abeer. It was the next morning and Abeer had already made out the high level work break down structure which he wanted to show Ahsan. He was also interested in knowing why Ahsan had called him in.

“Yes please. I saw your email last night but did not get a chance to review the work break down structure. But first, I want to talk to you about our yesterday’s meeting. There is something we need to handle which I fear is one of the most difficult parts of a project. Expectation management”!

“So far things are going well because we are dealing with experienced people like Ayesha and Eihaab. The moment we start dealing with line managers, issues would crop up. I have already talked to Minha and asked her to start with Marine Insurance use cases so that your team can focus on development tasks and not worry about requirements gathering.”

“Our greatest challenge would be to build your Marine Insurance System while entertaining the wish lists. Whenever the design gets too complicated due to the wish list, we need to stop and go back to Ayesha and Eihaab to inform them about the particular issue. They will hopefully play a key role in making their users understand.”

“This does not mean that we will take out their wish list from the use cases but in our technical specifications we will remove those features and separately highlight them to be out of scope for the current implementation. We will only build what is necessary to run the business” said Ahsan thoughtfully.

“Yes, I understand the sensitivities. I will try my best to keep things under control. I plan to write a weekly status report on the project and give to you so that you are very much in the picture. I understand the importance of escalating all key decisions because two heads are better than one” responded Abeer.

“That is music to my ears. Most technical people are very weak in this area and some never understand the full implications of their decisions made in silo. This is precisely why I chose you for this project. Well then we are ready to begin. You can now show me your work breakdown structure” said Ahsan happily.

They both now started to discuss the printouts that Abeer had brought with him.

WHAT'S ALL THE EXCITEMENT ABOUT USE CASES?

It was the next morning Minha was waiting in the PakInsurance meeting room. She had requested Ayesha to arrange a kick off meeting with the underwriting team of Marine Insurance department.

After the initial introductions she explained that they would need to understand what exactly is a use case so that these can be properly used in the ongoing project.

“We use these to document the functionality. These are written to highlight the basic-flow and all the alternate-flows” saying this Minha glanced around. She was amused to see that the whole Marine underwriting team was sitting lost including the Manager. They were a patient lot and Minha was impressed.

“Let me explain” she continued. Any piece of functionality for example defining a new customer requires a standard set of information to be captured by the system. This becomes the basic-flow; this is also affectionately called the happy-flow. It just focuses on the standard path and the sequence of activities. So if you choose your basic flow to be the new customer flow then you don't have to worry about the case where the customer already exists.

“But then how do we capture the case where the customer already exists”? asked Ayesha on behalf of the whole team of PakInsurane.

“This is captured in the alternate flows. All cases where you have to deviate from the simple path are captured there. For example you may have a field that captures the number of employees of that organization and additionally you have a business rule that alerts the data entry person if any value less than 10 is entered just as a reminder to double check with the customer whether this information is correct” responded Minha.

“You see, since you don’t overload the basic flow with all these extra rules and conditions it remains simple and comprehensible. All the complexity is divided between the basic flow and the alternative flows. This is why I like these a lot” continued Minha with a smile.

“Sounds good” said Ayesha. She now asked the underwriting manager for Marine Insurance whether he understood the discussion.

“I think I do but it would help if I am given a few sample use cases for review. That way I could clarify any confusion before the system use cases are given to me for signoffs” mused the Manager.

“That shouldn’t be a problem. Will send some through email as soon as I get back to the office” said Minha.

They now focused their attention to the discussion about the workflow followed by the Marine underwriting department. Minha had taken along both her team members to get introduced to all the players as well as get a feel of the project. They also joined the conversation and Minha and her colleagues made a good impression because of their domain knowledge which they had picked up working with previous general insurance clients.

Minha sent the samples upon reaching her office. She was quite satisfied with the events of the day so far. She realized that now it was time to step on the accelerator. Abeer would soon be asking for signed off use cases for the Marine underwriting department.

SHARING THE PLAN

Abeer had made out his plan and had shared with Minha. There were a good number of activities that she had to finish on time so that Abeer could finish his part in time.

Minha would have to wrap up the complete use case model and descriptions for Marine Insurance for all the following areas within a month and a half otherwise Abeer was going to be in trouble

- Quotation
- Policy administration
- Premium accounting
- Claims
- Re-insurance
- Renewals

Abeer had no room to make up once his team fell behind.

HAVING FUN

Ahsan knew that while work was on everybody's mind it was also important to gel the new team together. Abeer and Minha had worked together on other projects and knew each other well but there were new junior members in the team who had never worked together.

A beach picnic was planned on the weekend and everybody made themselves available. They thought about inviting Ayesha and Eihaab from PakInsurance but then it was deemed better to do this one for just the internal staff on the project.

Ahsan always believed in such outings and was so convinced that time should be taken out for these that he would be willing to plan it even on a working day. After all these outings have significant impact on team productivity and ultimate outcome of projects.

On the morning of the picnic everybody was assembled at the office and the van was ready. They did not have to worry about food because the caterer would prepare fresh barbeque at the beach.

It was not free seating in the van, Abeer and Minha made sure that each team member sat next to a member of another team. This way

they would get a chance to chat with each other and get to know each other better.

The ride was smooth and the beach hut was comfortable and spacious. They dumped their stuff on the chairs and ran out to enjoy the beautiful sea and the white sand. Karachi was gifted with very nice beaches and Ahsan had managed to arrange a hut which was situated at the best section of the beach.

Abeer came and sat next to Ahsan and started the conversation “I was just thinking; one area that I have always been weak at is estimation. How do you do these?”

“This is one area that baffles us all. There are many methodologies that people follow but really the best estimates come from historical data and domain knowledge. There is no substitute for these” replied Ahsan and then looking at Abeer’s inquisitive expression carried on.

“You see it works like this, you simply cannot estimate something that you do not know and understand so for an estimator the first step is to acquire as much knowledge and details about what is to be built” continued Ahsan.

“But most of the time one does not have enough time to gather the knowledge. How do you estimate then?” asked Abeer.

“Well, in that case the best approach is to either ask for more time or even better, ask to break the project into requirements gathering and the rest like we did in the case of PakInsurance. Of-course you should not give your estimates for the rest of the phases till the requirements phase completes; unless the client is willing to take a large range instead of the date for completion of work” continued Ahsan while he took a deep breath to take in the fresh beach air.

“I somewhat understand what you are saying but what do you mean by a range?” inquired Abeer.

“One has to explain to the client that there are so many parameters and variables that one has to manage in a large project; it is simply not realistic to expect an accurate estimate early in the project. There are tools like the one freely available on construx.com website that helps but after all the project manager is the best judge of what are the worst and best case scenarios” continued Ahsan who always enjoyed such conversations with younger team members.

“So you are saying that the project manager has to work out the worst and best case scenarios and come up with the earliest and latest possible dates for a project?” added Abeer.

“Yes exactly! This way the client knows about possible time lines and is not shocked at schedule slips which are so common in the

business of software development. These things don't happen because the team is not working hard. It is due to the fact that software is probably the most complex creation of the human race. There are so many variables that can against you that any optimistic deadline almost always ends up being missed" continued a philosophical Ahsan.

"I now understand the background behind this project's approach especially the part that Minha is playing. But what would my team achieve by developing even before the whole project requirements are gathered?" said Abeer now coming to his real question.

"In this project another high risk area is client's lack of readiness for such large business process changes. They are not technology savvy but are very excited about getting this new software. So we will build for them a smaller version for only one line of business and implement it at the head office and some branches to give them a full feel of what is coming on a larger scale. Additionally, we would give them a production quality working program at the end of each iteration so that the client can fully test it and get a proper feel of the working software" said Ahsan.

"A few months down the road we will launch trainings and begin a cycle of active change management so that the transition is as smooth as possible" continued Ahsan.

“Hmm. That makes a lot of sense” said Abeer now looking quite relieved since his confusion was removed. He asked his leave and ran off.

Ahsan went and dipped his feet in the water. It was cool but not chilly. He was once again assured of such Team-building outings. He seriously doubted if they could have had such a heart to heart discussion back at the office. Abeer being a bit shy like most techies would never have approached Ahsan to clarify such thoughts that burdened his mind.

THE FIRST PMT MEETING

The first project management team (PMT) meeting was planned in the first week of the project start. Since the mobilization of resources was done and project had started it was a good idea to have the PMT at this stage.

The PMT would include Amna who was the Senior Executive Vice President for IT along with Ayesha and Eihaab from PakInsurance and Kamran and Ahsan from InsurSoft. The PMT was going to meet every two weeks as decided earlier. It was also decided that on need basis other members may also be invited for certain meetings to get clarity on any ongoing issues.

Ahsan made a short presentation at the beginning of the meeting to give an idea to everybody about the mobilization of relevant resources. He also highlighted the need for Marine Underwriting team to allocate at-least 16 hours in the coming week so that Minha and her team could start work on this area of the project.

It was also highlighted to the PMT that Abeer's team was depending on Minha's team and hence all support and time had to be extended to Minha for smooth flow of the project.

He also explained to the PMT the concept of a running scorecard of delays from either side.

They all appreciated that it would give them a good early warning system.

Amna explained that they had dedicated Eihaab's time to the project and have given him the role of project coordinator from PakInsurance side. He also mentioned that the additional management trainees (fresh MBAs) are being hired by PakInsurance to learn and take on operations related burden of various departments so that experienced resources could give proper time to the project which they estimated to be about 3 full-time employees from start to finish of the project.

This information really delighted Kamran and Ahsan and they congratulated the PakInsurance team on this excellent approach.

The meeting ended with both teams feeling quite satisfied with the progress so far.

THE FIRST RELEASE

Abeer decided to time-box his iterations and keep each one spanning over 1 month. Since the project started on a 1st, he was looking towards Minha to come up with the first set of use cases by the end of the first week.

Abeer and Minha had already gone over the project details and were comfortable with the fact that there were no significant technology risks which would need to be taken up in the first iteration.

Abeer's team of 5 developers was already onboard. The 2 senior developers were hand holding the 3 new developers. He had spoken to each member in group as well as individually about the absolute zero tolerance in terms of quality. "If you want to err, err on the side of missing the deadline but don't compromise on quality. I get upset when you don't meet deadlines but I get mad when I find that basic guidelines/standards have not been followed" he said to each member.

MINHA DELIVERS ON THE PROMISE

It was the sixth working day from the start of the project and the first week was over. Minha's team had delivered 3 use cases complete with basic flow and alternate flows.

Abeer was sitting down with his team going over the use cases and was really impressed by the quality of work done by Minha and her team. The descriptions were not only clear and concise; they were very easy to read.

He divided the team into 3 groups. The first group consisted of one senior programmer and one junior programmer. The second group was also composed similarly. The third group was of-course a one man group composed of the remaining junior programmer.

Abeer decided to assign the easier use case to the one man group and the two tough ones to the two pairs. He wanted to encourage pair programming from the start because that would be a good way to get the standards well communicated to the junior team.

The decision paid off! The groups delivered by end of the first month/iteration. The mid month review had showed that one use case would not be fully completed by the end of the iteration. They had decided that out of the 6 flows (1 basic flow and 5 alternate flows), they would

only complete the basic flow and 2 alternate flows but the team understood that whatever is to be delivered is going to be of production quality.

THE CUSTOMER GETS THE FIRST EXPOSURE

The first iteration had completed on time with the restricted scope of 2 complete use cases and 1 with only basic flow and 2 alternate flows.

The relevant members of Marine Insurance department of PakInsurance along with Ayesha and Eihaab were invited to InsurSoft.

Ahsan was present, he had done some of the testing himself of the first release, he had also done some sample code reviews.

Abeer and his team along with Minha and her team were all present. They were all quite excited about the first release.

The session was arranged at one of the presentation/meeting rooms and they had planned to hold a half hour training session for the key users and then 1 hour of testing using the test scripts which they had jointly prepared. The last hour was supposed to be a test-as-you-go session where the users would have a free hand to test various practical scenarios which were somehow missed in the test cases.

The training session and initial testing using the test scripts went well. Abeer had involved the InsurSoft QA team from the start and they had

done a solid job of weeding out most of the bugs. Then they broke for tea and resumed after 15 minutes to do an hour of adhoc testing.

This is where things got a bit out of hand. The users had brought along some very unique scenarios which were new even to Minha. When they started to discuss that the system is not capable of handle these, Abeer looked towards Minha for help.

“Well. I understand the scenario and from my experience I can tell that this is one of those cases which occur one or two times a year. Isn’t that right?” asked Minha.

On receiving the answer in the affirmative she continued “If we look at our requirement, then in this case the system would not be required to capture any additional information but would need to do two extra calculation steps, right?” She just paused to glance at the users and then again continued “this means that once or twice a year we would need to do this calculation manually outside the system if we don’t build this functionality”.

At this point Ayesha spoke “Minha, I understand where you are coming from but won’t it be nice to have all these features in place so that we have a complete product?”

“Yes very true! But I had already discussed this scenario with Abeer since we have faced it with one of our earlier clients. We both feel that this would unnecessarily complicate the design and the benefits are just not compelling enough” responded Minha.

Abeer was shuffling some papers while the conversation was going on. He now joined the conversation “Ayesha, I want to share with you my current entity relationship diagram (ERD). Please have a look at this and I will get my team to build another for the proposed scenario and send over to you. Then we can meet again tomorrow or day after to review both the ERDs and discuss the details. Does that sound ok?”

“Yes, I think that is a good idea” responded Ayesha.

The first session had gone reasonably well and they all thanked each other and the session ended.

EIHAAB TO THE RESCUE

It was 11am the next morning and Ayesha had received the new ERD from Abeer. It showed that the requested feature would convert some of the relationships from one-to-many into many-to-many. Ayesha understood well that it would complicate the overall system design and make the software more complex to develop and use.

She was still not very convinced whether PakInsurance should back-off from the requirement or push for it.

She picked up the phone and called Eihaab. After discussing the details of the new ERD she asked him the question that was bothering her “Should we push for this requirement?” she asked.

“Well, I have been on the phone just before you called. I contacted an old friend who works in GlobalInsurance. They use a state-of-the-art and very expensive general insurance solution used in over 500 insurance companies worldwide. Guess what? Even they don’t have the feature requested by our people” Eihaab responded.

“I guess Minha was right after all. She seems to have a very good idea of our domain. We are in good hands” mused Ayesha.

“You can say that again. The way they have handled the project this far has increased my confidence in them” continued Eihaab. “Our real worry is our user base. We really need to get them up-to speed and the new management trainees need to pick up the concepts very fast so that the experience people can start giving significant time to this project.”

“Let’s plan a meeting with our senior management and update them about the progress and also this key issue” said Ayesha.

She finished the conversation with Eihaab and soon after made the call to Amna’s secretary to setup the meeting.

MOTIVATION

Ahsan was sitting in Kamran's office. They had just finished reviewing the project status. They regularly did this exercise on the first Monday of every Month.

Ahsan shifted the conversation and said "I believe that the coming months are going to be very hectic and stressful for the team. While I will continue arranging at-least one outing every month, I want the team to know that if we meet the deadline then we all go on a company sponsored trip to Nathiagali, the incredibly beautiful hill resort in the North of Pakistan.

"Hey that sounds like a great idea" said Kamran. "I know from experience that by the time the project finishes the team is so stressed that such a vacation would do wonders to recuperate the lost energy for the next project."

Ahsan was now smiling ear to ear. This is why he liked working at InsurSoft, the senior leadership was willing to take advice and act on it. He continued "Yes, in addition to that it would be a great motivation for the team. They would look forward to the final finish especially since they are under enormous pressure at the end of each iteration."

"So, what are the details of the vacation? I might join you guys. Let's get all married team

members to bring their immediate families along” said Kamran.

“That will be great! Thanks a lot! Well, the plan would be to fly out on Friday night to Islamabad. On Saturday we would rent a ride to Nathiagali stopping in Maree for lunch. I will get all the reservations done through our travel agent and all should go smoothly” said Ahsan.

“When do we get back” inquired Kamran.

“We could cover most of the interesting places around Nathiagali in 3 days and head back to Islamabad on Wednesday to catch a flight back to Karachi. We could all be back at work on Thursday morning” said Ahsan.

“How long should we wait after GO LIVE to head out of Karachi?” asked Kamran.

“Probably the application should be out of the teething problems within a month. After a month we would need to see how our month-end-closing goes with our new application. Hopefully things would go well and we could leave around the mid of the next month. By that time the support team would be very comfortable with the application and we would be able to fly the whole team out” said Ahsan.

“Great! You have my go ahead! Please communicate this plan to the team so that we can move forward with full throttle” said Kamran while moving closer to his laptop to get back to his other work.

Ahsan came out of the meeting very excited. He talked to Abeer and Minha and they all decided to break it to the team over lunch.

PLANNING THE TRANSITION

The months have passed. Ahsan is sitting in his office and thinking about all that has gone by in the past few hectic months.

Minha's team has done the work on time and Abeer's team has built the software with high quality. Abeer's team used the software reusable class library quite efficiently but still got delayed by about a month due to the fact that they ended up with more bugs than they should have. Somewhere the process broke down but not too badly.

One month delay on a five month project is not something to be proud of but if the product is robust at the end of the day then it is not too bad, thought Ahsan.

PakInsurance had hired a software consultant to do the quality assurance of the specifications written by Minha's team for the whole project scope. That too went well and they got a pat on the back from the consultant as well. All the hard work put into review of all these deliverables had paid off. Peer review and all such activities are expensive and time consuming to do but Ahsan could not think of building high quality software without these.

He had got all the source code of sensitive programs reviewed by another team; even

despite the fact that this part was built using pair programming.

His main worry was now to get the transition done smoothly for the Marine Insurance line of business built by Abeer's team.

They would not worry about branches just yet although they had designed the software to fully cater to this requirement. They would put all their energies into implementing it smoothly at the head office.

The good part was that at-least one person in each of the following areas was now well versed in the software because she had done all the testing and given required sign-offs.

- Marine Insurance - Quotations
- Marine Insurance - Policy administration
- Marine Insurance - Premium accounting
- Marine Insurance - Claims
- Marine Insurance - Re-insurance
- Marine Insurance - Renewals

The difficult part was that not everybody in the related departments was keen and motivated to make the move to the new software.

Ahsan had to come up with a solid change management plan with the help of Ayesha and Eihaab and now the success of the project depended upon the success of this activity.

MANAGING CHANGE

It was a pleasant morning and Ahsan was feeling quite upbeat. He decided to call Danesh for a chat and also to get some advice on his current situation.

“Hi Danesh! Do you have some time to talk” said Ahsan as soon as Danesh picked up the phone.

“Sure! What’s up?” replied Danesh in a relaxed tone.

“Well! Just wanted to update you about the project and also get help on a tough issue. Are you ready?” asked Ahsan jokingly.

“Go on! But before you begin I have already heard about the Nathiagali plan. I like it but I would recommend going to the K2 Base Camp or to Shangrilla lake resort. That way your team gets to visit Pakistan’s tallest mountain which is also the world’s second tallest, standing majestically at more than 8000 meters. Or visit the Shangrilla lake resort and enjoy long boating trips” said Danesh with an air and expertise of the best tourist guide there is.

“But what is wrong with Nathiagali, it is beautiful, offers the opportunity for long walks

and is less expensive! I didn't want to push my luck too far with Kamran otherwise he may have shot down the whole trip due to budget concerns" explained Ahsan.

"Ok, maybe next time. I won't ask you to take me along because I know that it is a team trip and I don't want to be a party crasher!" said Danesh. "Well now you can tell me about the issue you are facing."

"The project as you know has gone quite smoothly. There have been some delays but the end product is quite robust. The senior management of the client made some noise about the delays but better sense prevailed; they let us off the hook when their own people told them that they loved the product" continued Ahsan.

"My main problem now is to achieve a smooth transition. We've got people in each department of Marine Insurance who are very well versed with the software and have thoroughly tested it. But it still seems that there is good amount of resistance in the ranks and I am afraid that some people might want to fail the project not because they are against the project but just because they are afraid of the imminent changes in the way they work" continued Ahsan.

"I understand; I am glad that you are taking this item seriously because if we don't handle this with care then the project might still fail even

after all the hard work the team has put in. Tell you what; we have Yumna, who is a specialist in change management. Let me setup a meeting with Yumna and she can take us through some of the details” offered Danesh.

Ahsan thanked him and requested Danesh to set it up as soon as possible. No time to lose.

TRAIN, TRAIN AND TRAIN SOME MORE

The meeting was arranged in Yumna's office and when Ahsan arrived, he found Danesh and Yumna in deep conversation.

"Hello there!" called Danesh.

He then went on to introduce Yumna and Ahsan and also informed Ahsan that he had briefed Yumna about the project.

Yumna now took over the conversation "It seems Ahsan that you have done all the hard work and gotten yourself into a very good position. I hear that the product is quite stable and fits the key needs of your client. I must congratulate you on this big achievement, not many of us can boast the same for some of our projects!"

"That is very kind of you" replied Ahsan. He immediately felt comfortable and relaxed.

Yumna continued "Your project covers one of the key business lines of the client. We must get it right or we might jeopardize the business of your client. We also know that the client is new in these kinds of software implementations so they don't exactly know what the immediate future holds".

“I would recommend that we go the extra mile in training so that the whole system user base is well trained when you go LIVE” said Yumna.

“Yes, I agree, and we have a champion in every department of Marine Insurance who has not only tested the system but has also signed off each deliverable from start to finish. Can’t these people now conduct the training and get the client ready for launch?” asked Ahsan.

“Yes, Danesh told me about your solid approach, but I would caution. These people are your champions but they are not technical experts. They have good knowledge of their area but not of the whole application. You can take help from them as the trainers and first line support but you would need to have your technical people available in most of the training sessions so that all questions are answered with confidence and accuracy” answered Yumna.

“Another area where you need to get your people involved is that of training exercises. In the case such as yours where the client is not very technology savvy; I would recommend that you have a test at the end of each training session and you need to be very sure about the passing criteria. This would be a good way to communicate to the client’s management if you feel that they are not ready for launch” offered Yumna.

“Hey, that is a great idea!” cried an excited Ahsan.

Now Danesh joined the conversation. “You will need to prepare the questions based on your team’s knowledge of the business process. Ayesha and Eihaab can review these along with your departmental champions and highlight the key areas of the business process which need to be focused on.”

“Sounds good; I will get the teams working on it right away!” said a smiling and relieved Ahsan. He had a strong hunch that this plan will work.

The meeting ended with Ahsan promising to have a great dinner after the successful software launch in which he would invite all his benefactors which included Danish, Marium and Yumna.

BOTH PROJECTS COME TO AN END

Ahsan is sitting in his room preparing for the Post-Implementation review meeting which is being done after two month's of Marine Insurance System GO LIVE.

He is thinking to himself. So far the feedback is good. Although the project of 5 months eventually went LIVE after 7 months because of development delays as well as delay of GO LIVE by PakInsurance after looking at the results of the training. The results were promising but showed that a lot of future application users weren't very clear about the business process to be followed with the new system. They had decided to go through with another cycle of training.

It was still a pretty smooth implementation. Kamran wasn't too pleased with the delays but he still sanctioned the trip to Nathiagali.

Ahsan had reviewed the full project specifications which Minha's team had developed. This part had gone the smoothest because Minha had good domain knowledge and her team had done well to write very detailed requirements without leaving ambiguity in their documentation. Ahsan knew now that the project could be done with very low risk because they had the full requirements in one place and a decent reusable code library had proved its worth during the software

development of the Marine Insurance business line. The client had also been through all phases of the project and now knew exactly what it would take to build and implement software of this scale.

Ahsan had done his estimation of the full project and was planning to pitch for it if the post implementation meeting went well. Kamran had reviewed all the numbers and liked what he saw.

Kamran and Ahsan reached PakInsurance and went straight to the designated meeting room. They were greeted by Amna, Ayesha and Eihaab.

They got down to business. “Ahsan, we have been in touch over the past months and we all know that the implementation went very well. We were quite late because a two month delay on a five month project is huge but I must say that this was a learning experience for all of us” said Ayesha who was now very confident as a person with a successful project under her belt.

“I have received and reviewed a list of small reporting related modifications which I would request to go over with your team to see which ones can be done” continued Ayesha.

Now Eihaab leaned forward to contribute to the conversation because he noticed a frown on

Ahsan's face "Don't worry, we have prioritized the list and have already communicated to our team that they will not get everything done right away. You are free to review and suggest if a simple data download can fulfil the requirement and we will go with your suggestions."

Ahsan responded with a smile "You guys are the best client I have ever had. I was about to suggest the download option but you have already thought about it. A quick look at the list indicates that there aren't any big issues. That is wonderful!"

Amna joined the conversation "I feel that Ayesha and Eihaab played a strong role in managing the project from our side. I have taken feedback from various people within the organization both senior and junior and they have shown their confidence both in Ayesha and Eihaab as well as your whole team" she said while looking at Kamran.

Then Kamran spoke with a smile "Does this mean that you would like us to propose for the full development project as well?"

"Actually no" said the Amna looking pensive.

This sent a wave of concern throughout the group. Then Amna continued "We would like you to propose, build and implement the full project!"

Everybody was now smiling and tea was brought in along with snacks.

Amna then discussed with the group why she was sure that InsurSoft was the best positioned to do the project within the most feasible budget. InsurSoft knows the full business process and the PakInsurance culture like no other. The two companies have already proved that they can be partners in this important company initiative and it is time to build upon the relationship.

She further explained that PakInsurance always gets bids from 3 to 5 companies for all major purchases and they would follow the process in this case as well but she again showed her confidence in InsurSoft by stating that their proposal would definitely be the best when technical as well as cost proposals are reviewed together.

The meeting ended and Kamran and Ahsan went out to the restaurant over looking the beach to have a celebration lunch and discuss further the details of the proposal that Ahsan would now work on.

PART 2

LESSONS LEARNED

We will now review each chapter to highlight the key ideas and also related ones.

SO IT BEGINS

- Large fixed-price software projects carry with them a high level of risk
- Off-the-shelf products require high-level of business process re-engineering and adaptation of the organization to the new system and its process
- Off the Shelf products at best only cover about 70 to 80 percent of the business functionality. This is the best case scenario and most organizations are not aware of this fact
- Deployment of Large software projects need to be treated as separate projects as they require a lot of time-consuming change management
- Most organizations go for custom made solutions as an escape from change management
- A well designed custom made software would need to be built by keeping in mind the most used functionality. It would be lean, easy to use and maintain. This would also require a large amount of change management, so there is no escape from it

ALL THAT GLITTERS

- Prepare a list of all risks which could impact scope, time, cost or quality of the project
- Some risks if they occur have a high probability to affect the committed time line
- Client expectations have to be managed upfront otherwise it could result in strained relationships and poor quality later in the project

TROUBLE

- Cash flows are important but one should not rush into high risk projects just because the organization is having a slow period
- While negotiating with your immediate supervisor try not to commit too early. It is better to put in solid ground work before an internal commitment is made
- Try to sleep over your big decisions. It is good to review last night's thought the next morning

THE INNER VOICE

- Historical data from past projects, ideally for similar domain and of the same nature, give the best estimates
- Estimation is the most risky part of project planning and should not be confused with targets
- By increasing personnel on the project you can only compress the schedule to a certain limit. Each organization / team should experiment with the popular equation to arrive at a reasonable schedule estimate “ $3 * \text{effort-in-man-months}^{1/3}$ ”
- Motivated teams and high performers can achieve fantastic results but to estimate large projects on this basis could be very risky. Large projects should be estimated with average people in mind because various environmental forces may demotivate your team and also drive away your best talent
- Reach out to trustworthy and knowledgeable friends when looking for good advise

EXPERIENCE

- It is good to read the latest literature on managerial and technical topics. It gives you options and solutions when the going gets tough and you are out of ideas
- When asking for help. Tell the real problem to your advisor and be humble about your own limited knowledge and experience. Otherwise it would just be a big waste of time
- Cultivate friendship with good, helpful and knowledgeable people

KNOWING WHAT YOU WANT

- It is good to discuss ideas with friends over a meal. Meal times are generally happy times and people are more open to sharing knowledge and information
- Off-the-shelf products are good for organizations if they are a change-oriented organization. Unfortunately, most organizations want to expand aggressively without first making themselves ready
- Even if business processes are lean and efficient, software implementations would still require another round of business process re-engineering because automation often brings in a new dimension to the business process

- Customized solutions add value when the organization has very good business processes and are willing to go the extra mile to change these to better utilize the competitive advantage offered by information systems
- Large software projects require formal methodologies which give the project manager control and visibility throughout the project
- Sometimes it is good to mix various methodologies / best-practices to achieve the right result. This should only be tried when you are well versed and experience in the use of these best practices
- Reach out and ask for help from experienced people
- RUP is a strong software development methodology and is very useful in managing large software development projects. More details are available at wikipedia.org

THINK BEFORE YOU LEAP

- Large projects should be split into two phases. The first phase should finish when complete requirement specifications are built and signed off

- The second phase should not be committed in terms of budget and schedule till the first phase is complete
- There is good evidence / research which points towards this approach to be a very good one. The size and complexity of large software projects makes it almost impossible to deliver a high quality product within tight budgetary and time constraints
- The estimators of the second phase also stand a better chance of negotiating with the client in terms of functionality. For example, if the client's budget is tight then functionality can be prioritized and only the most necessary part can be built to suit key client needs

DIVIDE AND CONQUER

- As the chapter name suggests, it is good to split large software projects into manageable parts
- Building and deploying partial (but production quality code) early takes care of a lot of management, technical and deployment / cut-over risks
- Exposure to a concrete part of the application gives the client a chance to look at the real thing and be able to decide

whether the path taken by the developers is correct or not

- Time boxing is a very good agile technique and details are available at wikipedia.org
- Test driven development is a very good agile technique and details are available at wikipedia.org
- Daily builds is another good technique to develop robust software with minimum bugs. More details are available at wikipedia.org
- Most clients over-estimate their readiness for GO LIVE and software practitioners should develop ways and means to make the client understand. Once the client chooses an approach suited to its internal culture; only then smooth GO LIVES are achieved
- Good project managers ensure that they have all the project tasks listed and have mechanisms to ensure that nothing is missed out at the planning stage. It is obvious that if you miss a set of tasks then late in the project when pressures are maximum it would be almost impossible to accommodate these without schedule and budget slips

DO THEY LIKE IT TOO?

- Prepare well before important client meetings. They can sense a weak argument better than you think

THE BIG DAY

- Clients should dedicate the best available resources to the project or acquire (and then trust) the same when none are available in-house. Large software projects can make or break the client organization because of their high impact level to the very fabric of the business
- Be patient when fielding client questions. Most people ask questions just to clarify their thoughts and not to corner the presenter

BULL'S EYE

- Never forget to thank the people who are the source of your success

THERE IS METHOD TO THIS MADNESS

- Sometimes you have take best practices from other methodologies to work with your organization's standard methodology to achieve the best results
- It is recommended to fully understand and test these methodologies before applying these to high risk projects. But then sometimes you just have to carry the risk

THE TRUE TEST

- It helps to have dedicated team leads handle various sensitive tasks. These team leads should be selected on the basis of their skills and specialization
- Good brain storming techniques need to be applied to come up with a workable project plan and task dependencies. Mind mapping is one such technique
- A good project plan does not just happen. Painstaking efforts need to be expended to achieve the same
- Regular meetings of the key players from both organizations is necessary for timely information dissemination, decisions and ultimately, project success

- For time constrained projects, nothing helps more than a stable reusable library of extensible classes and source code

NEED SOME LADY LUCK

- It is good to document the meetings by writing minutes immediately after the meeting. It not only captures the facts well but also serves as a communication tool for various people who are part of the project
- Other material like high level plans and presentation material should also be documented to help in communication
- People should review meeting material before the meeting so that you can get right to the point
- Planning should be done at high level for the overall project but only the current iteration and phase should be planned in detail
- To achieve buy in from key team members it is important to have their input incorporated into the detailed plans

IS EVERYONE ON THE SAME PAGE?

- Have cross-team meetings to share knowledge and information
- Establish channels of communication
- Seek commitment from all team members and key client personnel
- Have rules and guidelines that govern the project team
- Have mechanism to capture delays, for example a running scorecard which highlights delay against each deliverable, signoff or action / decision
- Be wary of half baked ideas
- Don't complicate the design unless the additional feature is really bringing in a lot of value

THE SUM OF ALL FEARS

- Manage wish lists very carefully
- Have weekly project reports
- Escalate issues the moment it is clear that these are beyond the authority of the particular team lead or team manager

WHAT'S ALL THE EXCITEMENT ABOUT USE CASES?

- Use cases are a very good way to capture system requirements
- It is important that all contributors to the project understand the utility and purpose of the use cases
- All ideas and concepts should be “sold” to the client and the client should not get a feeling that they are being forced to do a particular thing

SHARING THE PLAN

- It is good to use tools to come up with the critical path so that you know exactly which tasks must finish on time for the project to finish on time

HAVING FUN

- Team building efforts need to be done regularly and often
- People / teams take time to gel together
- Over time, due to work pressures sometimes the relationships between team members become strained and it is good to

have outings to give people a chance to mend relationships

THE FIRST PMT MEETING

- The project management team (PMT) should consist of key players and should meet regularly
- The PMT should use this opportunity to discuss all important items that impact the project including resource allocation, key decisions, feedback, delays, opportunities, etc.
- The client has to commit dedicated resources for large projects because there are many tasks that need to be coordinated, documented and finalized from the client side as well

THE FIRST RELEASE

- The development team should understand that maintaining quality is their responsibility
- Ideally deadlines should be met and high quality code should be delivered on time, but if there is a compromise that must be done, it should not be quality of code / deliverable

MINHA DELIVERS ON THE PROMISE

- The requirements should be written clearly and with the least amount of ambiguity
- Sometimes you can start technical work on the requirements even before these are signed off by the client, but it is not generally advisable
- Pair programming can be employed for tough development tasks and also to have an informal mentoring program within the development team

THE CUSTOMER GETS THE FIRST EXPOSURE

- Each iteration software release should be well tested by the internal team as well as the client
- Some organizations have strong quality assurance and testing departments but the developers should be made responsible for their own testing. Quality assurance should not be able to find obvious bugs. Only the ones which are very hard to find and require experience and specialization
- Test scripts should be prepared ideally before the development starts

- Test scripts help you comprehensively test the system and weed out all bugs well before GO LIVE
- Do the homework and show to the client's technical team the exact impact on the system design of certain "nice to have" functionality. It will go a long way to convince your client and make them more sensitive to these issues

EIHAAB TO THE RESCUE

- Wish list needs to be very carefully weighed against the cost / benefit aspect
- Rarely used features should never be built into the application because they make the whole application complex and difficult to use

MOTIVATION

- It is very motivating for the team to know that they would get high quality time off if they pull off the project well
- Trips requiring air travel and accommodation can get quite expensive but if you weigh the benefits of a highly motivated team then the decision is an obvious one

PLANNING THE TRANSITION

- All project deliverables should be peer reviewed in addition to the review done by quality assurance team
- There should be upfront planning to handle the transition phase of the project. Sometimes this can be the most difficult part

MANAGING CHANGE

- Change management has to be taken very seriously and decent amount of time needs to be allocated to this important task
- Most people don't like changing the way they work. Whenever change is brought in there is almost always a good bit of resistance from various quarters

TRAIN, TRAIN AND TRAIN SOME MORE

- Often project managers forget the vision behind the software development / deployment effort
- The software must deliver the key features
- A well trained user base is the biggest asset to achieve a smooth GO LIVE

- The training has to be a team effort between technical and functional experts
- It is important to test the comfort level of the user base in terms of knowledge and skills with the new application before GO LIVE

BOTH PROJECTS COME TO AN END

- Post implementation review meetings should always be done within a couple of months of GO LIVE
- Clients are willing to pay more and be flexible in terms of time lines as long as they know that the software vendor will go the extra mile to develop a high quality product which is designed to fulfil the key needs of the client

PART 3

WHAT YOU SHOULD AVOID?

This part proposes a list of all the mistakes that you should avoid while planning and executing a large software project. The list is a work in progress.

This list is broken down into two broad categories; Management and Technical. These are then further sub-divided.

We hope to enhance the list, over time, with the help of your feedback.

MANAGEMENT

BUSINESS CASE

- Not considering all the direct and indirect costs of development. For example, development server, version control software, development database server, quality assurance database server, UPS, generator, backup server, additional development tool licenses, printers, testing tools, space / rent and infrastructure, salaries, etc.
- Not correctly calculating the total cost of ownership of the software, for example, missing to calculate
 - o Maintenance cost
 - o Additional database license cost
 - o Additional client and server operating system license cost
 - o Cost of additional PCs, servers, printers, etc.
 - o Cost of support team and programmers
 - o Cost of additional network and internet bandwidth

ESTIMATION

- Lack of proper project estimation
- Use of only one estimation technique. Generally, at-least two techniques with different approaches should be used to

come up with a realistic estimate. Some popular techniques are function point analysis, COCOMO, Delphi wide band technique, Use case estimation method, etc.

- Underestimation of domain complexity
- No historical data available for estimation of effort and cost
- Confusing targets with estimates and commitments
- Getting influenced by pressure from client or internal management to give an optimistic estimate

PLANNING

- Not getting the project team structure right, for example
 - o No official project sponsor
 - o No project management team
 - o Lack of project team structure without proper reporting
 - o Project manager and team leads wearing too many hats, i.e., performing too many roles
- Too little high-level planning
- Too much detailed planning of later iterations / phases
- No identification of the critical path

- Lack of buy in from project team members into the project vision, schedule, etc.
- Selection of inappropriate software development methodology. One that is not suitable to large software projects
- Unrealistic schedules
- Incomplete planning. There may be tasks missed out
- Lack of planning for data conversion
- Incomplete risk list / identification
- Too little budget
- Over reliance on specific high performing human resources
- Commitment of budget and timeline even before detailed requirements have been written and signed off
- Lack of commitment from client organization / senior management
- Lack of commitment from software vendor organization / senior management
- Incorrect risk mitigation strategies
- Lack of knowledge about contemporary best practices

- Over confidence on the team's ability to achieve certain targets
- Over reliance on short cuts to achieve difficult targets
- Holidays and leaves are not considered
- Commitments from stakeholders other than the development team have not been sought against activities that require them

MONITORING

- Poor monitoring of project tasks against the plan resulting in incorrect picture of the progress
- No regular mechanism to update the overall plan according to current project progress. Ideally the software development plan should be updated at least once a month
- Too much experimentation with new practices, new tools and new technology
- Too little innovation. Religious adherence to the chosen process without considering ground realities
- No mechanism to identify delays early
- No mechanism to identify issues early. Lack of processes in place to allow issues

to be raised during the development process

- Poor subcontract management. If part of the project is given to another software organization to build then that contract and related activities have to be carefully managed
- Lack of good documentation, for example, high level plans, minutes of the meeting, key decisions, etc.
- Project manager not having proper authority over her personnel
- Lack of regular status reporting by the project manager to the stakeholders
- Lack of regular meetings of the project management team
- Lack of control and visibility into the project. For example, the common question “Are we really 90% done?”
- Poor risk monitoring
- Lack of expectations management
- Scope creep. Injection of large amount of non critical features
- Lack of regular demos to the client of the under-construction product. Ideally every month the increasingly functional product should be handed over to the customer for testing of newly added features. This will

go a long way to give the client confidence
and also a chance to give feedback

TEAM BUILDING

- No team building efforts
- No team cohesion due to lack of trust
(usually missing in new teams)
- Totally new team with all members either
new to the organization or coming from
other projects and clients
- No provision to let the team gel together.
For example, team outings, team training,
etc.
- No efforts to mingle the technical as well
as the functional team members
- Resistance to reaching out for help from
knowledgeable people
- Lack of open discussion and sharing of
knowledge within team
- Too much variation in technical level of
the team, i.e., a few team members with
huge experience versus novices coming out
of University. This may not be a bad thing
but it has to be properly managed

HUMAN RESOURCE

- Failure to assign / hire an appropriate project manager who has the necessary skill and experience to lead the project
- Failure to assign / hire an appropriate requirements gathering expert
- Failure to assign / hire an appropriate system architect / designer
- Failure to assign / hire an appropriate software development team lead
- Failure to assign / hire an appropriate quality assurance expert
- Failure to assign / hire appropriate software developers
- Failure to assign / hire appropriate testing experts
- Failure to assign / hire an appropriate change manager
- No rewards if the project is done well
- No attention to team morale
- Lack of regular attendance to important project meetings by team members
- Lack of inter-team coordination.
Specially between technical and functional teams

- Poor negotiation skills of the project manager and team leads
- Poor persuasive power of the project manager
- Poor persuasive power of the change manager
- Lack of good resources from client side
- Lack of patience, politeness and gratitude from project manager
- The project manager and team leads don't give 100% dedicated time. Time sharing with other projects
- Poorly managed workshops / meetings
- No brain-storming workshops / meetings
- Too many brain-storming meetings (analysis paralysis)
- Lack of communication about the importance of the project
- Lack of preparation before important meetings
- Negativism and de-motivating attitude of certain team members
- Lack of team motivation
- Poor compensation and reward system

- Non availability of senior staff and friends to whom the project manager can turn to in time of need for advise
- Lack of understanding and experience related to large software projects and their eccentricities
- Lack of experience of the project management team in handling large software projects
- Lack of appropriate human resources
- Lack of adequate human resources
- Lack of timely availability of appropriate human resources
- Too much attrition in the team

TRAINING

- Lack of management training for project manager and team leads
- Too little or no technical training for the developers and other team members
- Lack of training of key staff who is going to use the new software
- Lack of understanding of the new business process

- Lack of coordinated training between technical and functional team members
- Lack of testing / feedback about the effectiveness of the training
- No effort to educate the client as well as the project team members about the technical jargon used in the project documentation

CHANGE MANAGEMENT

- Lack of client organizational agility
- Resistance to change
- Poor change management by the team's change manager
- Over estimating the system benefits. Hence creating resistance when people realize that the system is not delivering against the expectations
- Resistance due to lack of communication. Sometimes the management needs detailed reporting and for this purpose the system needs to capture this additional information at the time of front-end data entry. There are benefits but they are hidden from the person who is doing the additional data entry

- Lack of selling to the stakeholders as well as the people who are actually going to use the software
- Too little time for change management

TECHNICAL

REQUIREMENTS

- Failure to get signoff on requirement specifications from users
- Failure to document the security and access control requirements for the proposed system
- Ambiguous and unclear requirement specifications. For example, failure to properly answer any or all of the following
 - What detailed features and functionality are required?
 - How many modules? How do they interact with each other? How often do they interact with each other? For example, in an insurance system, the claims module talks to policy administration module, etc.
 - How many external interfaces?
 - How many transaction types are there? For example, in an accounting system, we have journal vouchers, payment vouchers, etc.
 - How is each document / transaction-type saved, edited, posted, approved & routed?
 - When can you edit a saved document and when you can't? For example, you may be allowed to edit a payment voucher till it is not posted. Once posted it can be reversed but never edited

- No mechanism to handle change requests from users after requirements have been signed off
- Failure to correctly capture statutory requirements which are generally quite complex
- Failure to correctly capture MIS requirements which are always quite complex
- Not incorporating non-functional requirements in the design, for example
 - o Failure to capture volumetric considerations
 - o Response time requirements
 - o Uptime requirements
 - o Scalability requirements
 - o Operational requirements
 - Backups
 - Fail-over recovery
 - Archiving
 - Data Purge
 - o Usability
 - Screen resolution
 - Specific software/operating environment (browser or operating system)
 - Accessibility requirements
 - Rich user interface requirements (drag n drop, etc.)
 - Number of clicks/buttons and screen flows to complete a particular function

- Failure to identify all stakeholders
- Failure to identify all users of the new system
- Incomplete requirements gathering
- Failure to properly acquire domain knowledge
- Failure to determine exactly which user department would be impacted in which way by a particular feature. Sometimes you may build a feature that would benefit another department (which asked for it) but some other department would need to enter data for it because they are the custodians. This will not work until a full buy-in is first achieved from all concerned departments

DESIGN

- Poor system architecture planning
- Too many design shortcuts which may have been done due to time constraints
- Too much design complexity due to unnecessary features
- Low quality technical design in terms of class diagrams and entity relationship diagrams

- Untested architecture. Sometimes new technology or performance requirements warrant the development of a prototype in executable form to test out the proposed architecture
- Failure to incorporate performance related provisions in the design. For example, you need to consider
 - o How will the data grow?
 - o How will the business grow?
 - o What would be the data purge cycle?
 - o What hardware will run this software?
 - o Will the architecture support the expected response times?
 - o etc.

SYSTEM INTERFACES

- Incomplete list of system interfaces
- Incorrect documentation of data volumes to be brought in through the interfaces
- Incorrect documentation of the data translation required while bringing in data from interfaces
- Lack of identification of online and offline interfaces

CONSTRUCTION

- Lack of standards and guidelines. You generally need guidelines for coding, graphical user interface, report formats, program and technical interface testing, report testing, query tuning, database design, deployment, etc.
- Lack of regular software integration
- Difficult and clumsy user interface
- Lack of ownership of their own code by the developers. Poor development culture
- Lack of unit testing
- Too many bugs
- No test scripts
- Unavailability of reusable software components
- Poor technical documentation
- Poor system architecture compliance. The developers don't comply with the overall application architecture envisaged by the software architects and designers

TESTING

- Lack of code inspection

- Lack of client side testing of the periodic software releases
- Lack of integrated testing
- Lack of volume testing. How much data?
- Lack of regression testing
- Lack of load testing. How many users?

QUALITY ASSURANCE

- Lack of in-depth review of requirement and design documents. Lack of quality assurance early in the project
- Quality assurance team under too much influence of the project manager
- Poor quality of the end product / software
- Lack of software metrics
- No post implementation review
- No lessons learned document
- Inadequate review of software metrics (if they are collected)

DEPLOYMENT

- Poor user guide / help documentation
- Deployment tool may leave many important tasks to be done by hand. Thus increasing the risk of errors
- No proper guidelines for deployment. For example, how to ensure that the latest source code is being deployed
- No trained and experienced deployment team

INFRASTRUCTURE

- Lack of proper hardware and networking setup for a large team of developers to perform coding activities
- Lack of proper development tools
- Absence of automatic testing tools
- Absence of automated source control and versioning tools
- Absence of code profiling tools
- Absence of bug tracking tools
- Absence of code analysis tools

- Absence of technical architecture modelling tools
- Absence of database modelling tools
- Absence of automated build generation tools
- Absence of binary (EXE and DLLs) deployment tools
- Lack of online help development tools
- Lack of proper infrastructure to test system performance. For example what would be the impact on the production servers when this additional application goes LIVE on them?

VERSION CONTROL

- No mechanism to manage annotated versions of source code as well as other deliverables

CONCLUDING THOUGHTS

We all know that most projects are not as lucky as the one in the story. There are so many things that can go wrong and they do.

The best planners, the best requirement gathering experts, the best software architects and designers, the best programmers, the best quality assurance personnel, the best change managers, the best implementers, the best trainers can't make a project succeed if the client is not open minded and willing to experiment and learn.

The field of software development is just a few decades old and is not like other fields like Engineering and Accounting which have evolved their methodologies and disciplines with experience and time. This message has to go out to all users of software intensive systems so that there is more openness to new ideas.

We as software development practitioners have to keep on trying to work with our clients and our teams to achieve the best possible results under the circumstances.

REVIEWS

“I always wanted a small, concise guide of things to look out for and to avoid when doing my projects. This book fills that space. I look forward to the next in its series.

Fawzia Salahuddin, PMP, Director – Projects, Alchemy Technologies (Pvt.) Ltd.

"It was interesting to read with practical insights into managing large software projects.....one can relate to the situations faced by the project managers"

Zainab Hameed, PMP, CISA

"This book discusses by the use of a detailed example, how project management could be carried out -- The book can be used as a case study in curriculum where Project Management is taught"

Sayed Yousuf, Chief Technology Officer, Progressive Systems (Pvt) Ltd

“This book is an effort to move the software industry away from fixed priced projects. It offers alternate project breakdown options which help reduce the overall project risk and also deliver better quality to the customer.”

Erum Khalid, Directory Technology, Alchemy Technologies (Pvt.) Ltd.

AUTHORS

Ansar Muhammad has been developing and managing large information systems for more than a decade. He has worked both as a software vendor and a software customer. He currently works at a large healthcare institution. He holds a BCS and an MS-IT.

Rahim Hasnani has more than 14 years of experience in the software industry. He has rich experience of large software projects. He is currently working as Chief Technology Officer at Itim Systems. He holds a BCS and an MBA.