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Failure to Launch: Scope Creep and Other Causes of Failure

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Keywords:

Systems developer
Stakeholders
Failure
Actor Network Theory
Scope Creep
Requirements Triage

ABSTRACT

One of the causes of information systems development project is scope creep. The increasing number of features demanded by stakeholders to be built into the applications within the fixed time limit is a recipe for failure. This article looked into the process of a web application development failure, where scope creep deemed as the main cause. However, an in depth looks into the time line of the project also reveal another cause which was the failure of the application itself along with the platform (hardware and software) to actually execute the software. It is believed that Actor Network Theory frame work is appropriate to analyze the case where human and non-human actors involved.

Data were collected using participative observation. Data would be analyzed following Grounded Theory method. The analysis will be conducted to find pattern of negotiations and communications between all the stakeholders during the design process. Actor Network Theory would be used to explain the power play between stakeholders. A model of all the actors (stakeholders) and how the interplay among them was build which at the end.

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1. INTRODUCTION

Scope creep is one of an information systems development project problems [1]. In his model of requirements triage, Davis [2] proposes that a system requirements specification is a balancing act of three axis, namely resources (usually represented by financial restriction), technical (usually represented by development team which means required technical effort to build the requirements), and customer (usually represent demand for software features). Turban and Volonino [3] argue that a systems development project is constrained by three factors, which is time (similar to customer), budget (similar to resources), and scope (similar to technical). Scope creep would case more time needed to build the systems according the growing specifications. More time usually translated into increase in budget. At the end it could end up as runaway projects [4]. In time constrained development, scope creep is something that undesirable by developers.

This paper analyzes a web application development project that has been over time and over budget due to a scope creep. The power play of application developer team (technical aspect), managing director (financial aspect), and president director (customer aspect) were viewed from requirements triage [2] and Actor Network Theory (ANT[5-7]. It is not only why but how those three triage factors worked and being played by the three actors would be analyzed.

ANT shows how an idea (in this case web applications and all its features) being diffused and adopted by an organization by the means of various actors [8, 9]. Bardini said that ANT deals with [10] :

> *"… progressive constitution of a network in which both human and non-human actors assume identities according to prevailing strategies of interaction. Actors' identities and qualities are defined during negotiations between representatives of human and non-human actors. The most important of these negotiations is 'translation', a multi faced interaction in which actors: construct common definitions and meanings, define representatives, co-opt each other in the pursuit of individual and collective objectives."*

Tthe main feature of ANT is Translation Process. The translation process consists of four stages [11]:

1. Problematization. Key actors attempt to define the problem and roles of other actors to fit the proposed solution, which was made by the key actors. Key actors proposed solutions to the problems. The key actors persuade the other actors that they all have the same interest and the answer to the problems is in the solutions proposed by key actors. The desired result would be the other actors would accept a set of specific conventions, rules, assumptions, and ways of operating defined by heterogeneous engineers which ultimately resulted in the formation of network.
2. Interessement. Processes that attempt to impose the identities and roles defined in problematization on other actors. The key actors and other actors enrolled in the new created network try to lock other non enrolling actors. They gradually dissolve the existing networks and replacing them with new networks created by the enrolling actors. The enrolling actors try to stabilize the new identities for the other actors.
3. Enrolment. A process where one set of actors (key actors) imposes their will on others. The other actors will be persuaded to follow the identities and roles defined by the key actors. This will then lead to the establishment of a stable network of alliances. The enrolment process includes among other things coercion, seduction, and voluntary participation.
4. Mobilisation. This is where the proposed solutions gain wider acceptance. The network would grow larger with the involvement of other parties that were not involved previously. This growth is due to the influence of actors. When using ANT to investigate IT adoption, a researcher would focus on issues such as network formation, human and non-human actors, alliance, and network build up. Stronger alliances would be likely to influence the decision to adopt or reject IT. In conclusion, ANT recognises that adoption of innovation is initiated by individuals who build a network of individuals (in the form of an organisation) and nonhumans (machine, tools, etc.) to adopt innovations.

2. RESEARCH METHOD

Participative observation [12, 13] was used as tool to collect data. Data collected were minute of meetings, various design documents, email communications, field notes, and various discussions with stakeholders. Using this method I was able to collect a lot of data that only available to insider. I also had the insider insight into the problems that might not be immediately visible to outsider.

The analysis was conducted based on ANT [5-7, 14] and requirements triage [2]. With requirements triage, the problem would be presented as a power play between financial, scope, and technical constraints [2-4, 15]. ANT would provide a framework to see how those three factors played by the actors to achieve their own agendas. A model of all the actors (stakeholders) and how the interplay among them was build which at the end.

3. THE CASE STUDY

PK[1] is a small company (less than 20 employers) which operates and manages a web site. This web site and its application are quiet popular with more than 300,000 subscribers. The main revenue of PK is come from paid subscription, merchandise sales, and paid advertising on the website.

The website itself was originally build based on MS Access and ASP running on MS Windows Server Platform. The rapid growth of subscribers forced PK to port the web site using MySQL and PHP running on Linux Platform. Despite the change in platform the basic structure and framework of PK's web site remain the same. For the last 3 years there were many complaints, suggestions, and requests from subscriber to update the look and feel of PK's website. There were many social media inspired features demanded by subscribers. Adding new features to accommodate demands were not easy task with the old structure and frameworks. The look and feel of PK's web site was also deemed old and out of date compared to the latest social medias networking sites.

PK's management and stock holders decided to build a new website. At that time PK only had two programmers. PK's managing director also had programming and networking skills. The managing director usually managed the development team. They also had one graphic designer.

Due to the enormous tasks ahead, PK's management decided to beef up the development team. First they hired part time development manager to oversee the development team. They also hired two additional programmers. For web design, they hire an Australian web designer to work with the resident graphic designer. PK's management wanted the web to be modern, simple, and full functionality. The web site architecture was

[1] All names are changed and coded to protect participants privacy and keep data confidentiality

using n-tier model [16, 17]. It separates presentation layer, application layer, database layer, and data storage layer. It was built on Linux Platform using PHP and MySQL and utilizing AJAX and JQuery. The hardware itself remained the same.

The development itself started August 2011. The target was to finish the development and officially launched the website by February 2012. PK's managing director set up an internal development environment that mimicked the production system. The development team worked 5 days a week with approximately 40 work hours weekly.

In order to keep the deadline met, PK's management through the development manager set up a project management. Various deadlines and milestones were established to make sure February 2012 launch date were met. The February 2012 deadline was decided based on advertisers agreement. If the launch date were missed they would have to compensate the advertisers who paid for advertising on daily rates. Due to this reason, PK's development manager proposal to use parallel conversion [16] was rejected. PK's managing director opt for direct cutover instead to save time.

Various scope creeps were emerged during the development time. It was intensified during January 2012 closed to the launch time. Many new features deemed as the highest priority were pushed to the development team by PK's president director through the managing director. When PK's management suddenly had ideas to be incorporated into the new web site they immediately ordered development team to build it without consulting development manager first. Development manager as new and part time employee often bypassed.. It was understandable due to part time nature of development manager position. The development manager was only available about half of the normal working time due to his commitment on his main job. The programmers, who were already overwhelmed, did not dare to voice any objections. Any objections from development team would immediately crushed by PK's managng director citing that he was once a programmer for a big company and he said it could be done.

To accelerate development time and overcome required additional time due to scope creep, PK's managing director made some adjustments. First he relaxed the working hours for development team. They did not need to obey official office hours [9 to 5]. They were allowed to work overtime. They also worked on weekends. As financial incentives, PK's management promised additional bonuses if development team able to finish their work ahead of schedule. Unfortunately, as Brooks [4] pointed out, if a project were behind schedules additional resources would not accelerate the project into completion. The situation was exacerbated by intensified scope creeps on January 2012. The development team worked frantically work overtime closed to 18 work hours per day. They also cut vacations and worked on weekends. The development manager also dedicated more time away from his main job to concentrate on the completion. Despite all the bad signs, within the development environment the web site worked albeit with many features need to be polished.

On the launch date of February 2012 the new web site was moved into production environment. It took an all-night works to finished and polished features along with data migration from old web site to the new. Before launch, the managing director and development team tested the website in its production environment setting (not launched yet). For unknown reasons at that time, the presentation layer was not able to render the website using data from the application layer. The launch was postponed until they could fix the problems. The old web site was put on static for the launch and stays static until the new web site was ready.

The development team frantically tried to find and fix the problems. It took almost 24 hours (it made them almost 48 hours of nonstop work) to make it work. The development team needed to review and fix codes from all the scripts. By the morning of second day the web site is launched.

Within few hours of launch, complaints were coming. Mostly the complaints were about the lackluster performance of the new website and error 2003[2]. Due to the complexity of the problems, PK's managing director revived the old web site and postponed the launched until they could fix the problems.

The problems were two, first the quality of application scripts were inadequate. There were not enough time to test the scripts due to time and human resources constraints. They were only able to conduct User Acceptance Test (UAT) [18-21] instead of more rigorous test. Second problem was apparently the new web site demanded more hardware resources compared to the old one. It was known after the new web site was put into production environment. Direct cutover is the most risky conversion plans [16]. If the new system failed there were no backup. Luckily, in this case the old system was still available. At the end PK needed to add 3 more servers and change hardware configuration to cope with the workload of the new web site.

It took almost 3 weeks of reworks, the new PK web site finally launched. After the second launch, the complaints mostly regarding the features and the look and feel of the web site instead of performance. Another month of fine tuning, the new web site was ready and finely tuned.

4. RESULTS AND ANALYSIS

[2] Error 2003 was code that the database server is out of connections so it could not be reached by client

If we looked at the case description on the previous section, it is quite clear that the cause of failure were intensified scope creep near the launch date. Additional requirements and features to be built into systems require additional resources (budget) and time to finish [2, 4]. Davis [2] suggested a negotiation required to achieve compromise within the limit of available time, budget, and technical resources. Brooks [4] went further by saying adding resources into already late project would not accelerate the project completion. However, within this case, PK's president director (obeying the demand of advertisers) did not bulge. He demanded the ever increasing features to be built into the new web site with unchanged budget and technical resources. PK's president director as the main actor has imposed his will (driven by business deals with advertisers) to managing director and development manager, which in turn conveying the demand to developer team (programmers) [5, 22-24]. Not only the scope creep threatened the completion of the new web site, but there were no additional resources and time could be allocated to the project. While the programmers and the development manager and also managing director had somewhat naive view that the scope creep would be solved by adding more programmers or more working hours. Brooks has shown that adding more resources into already late project would not accelerate the completion [4] The developer etam themselves almost had no voice in objecting to the additional workloads.

The problems was exacerbated by the act of non-human actors [5, 9, 14, 25], which were the new website itself and the platform (hardware and software) it run on production environment refused to work. It was worked fine on the development environment [11]. The failure to launch was causing troubles and affecting all of the stakeholders as shown on figure 1 below. Figure 1 shows that the pressure from PK's President Director and Managing Director to the Development Manager and his team to finish on time while at the same time add more requirements to be build. As the result, the development team had limited time to conduct quality assurance and sufficient preparation to launch the application. The non human actor (the machines) due to poor QA and lack of preparation has failed to work when the application launched.

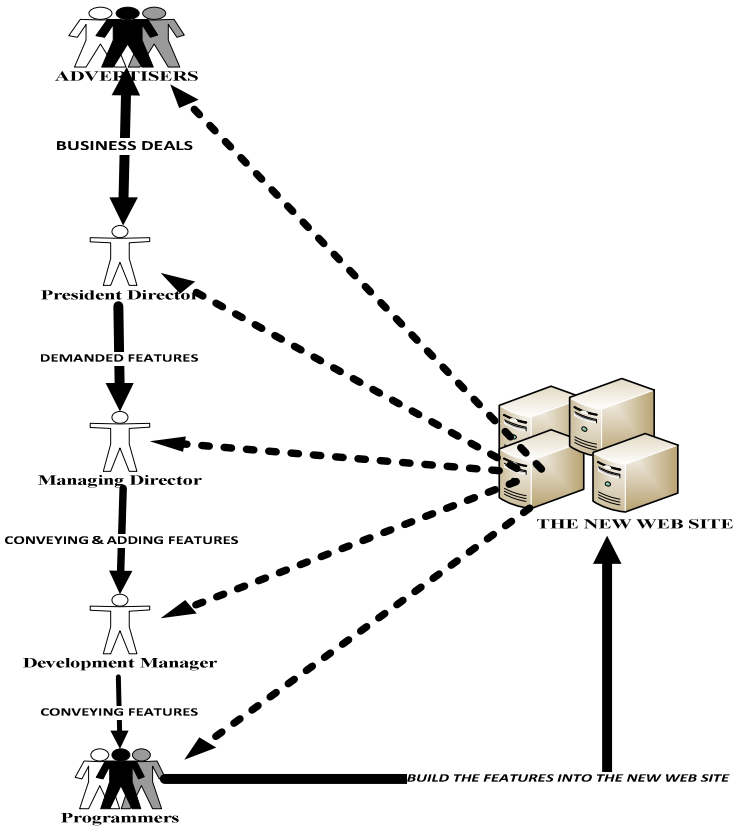

Figure 1. PK's Model based on ANT

Limited time and resources had prevented the new web site thoroughly and rigorously tested. The development team was only able to test the functionality and find error by asking fellow employees of PK to test the new web site. There were no other testing methodology could be employed. Development manager proposal to have parallel conversion was also rejected due to time restriction. Development manager argued that if his proposal was accepted they could found the problems and fixed it without sacrificing the subscribers who at that time was unable to use PK's website (old and new) for about 48 hours.

5. CONCLUSION

It can be concluded from both case description and analysis that scope creep was the main reason for PK's new web site launch failure. Scope change requires change in technical resources and time in order to complete the system [2-4]. The president director was acting based on pressure from advertisers pushed more requirements to be build in limited time and fixed dead line. Managing director carried out the pressure and chanelled to the developers team. Scope creep could be prevented and managed using negotiation by all the stakeholders to achieve compromise. If PK's management demanded new features built into the new web site, they should have considered the technical resources and time availability. They should have negotiated with advertisers to allow additional time. In addition to that, they should also have allowed time for testing and fixing which inherently part of any systems development. Additional time was also required due to additional features built into the new web site. However, due to limited resistant from development team (the programmers) and limited presence and influence of the Development Manager, the negotiation never took place.

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